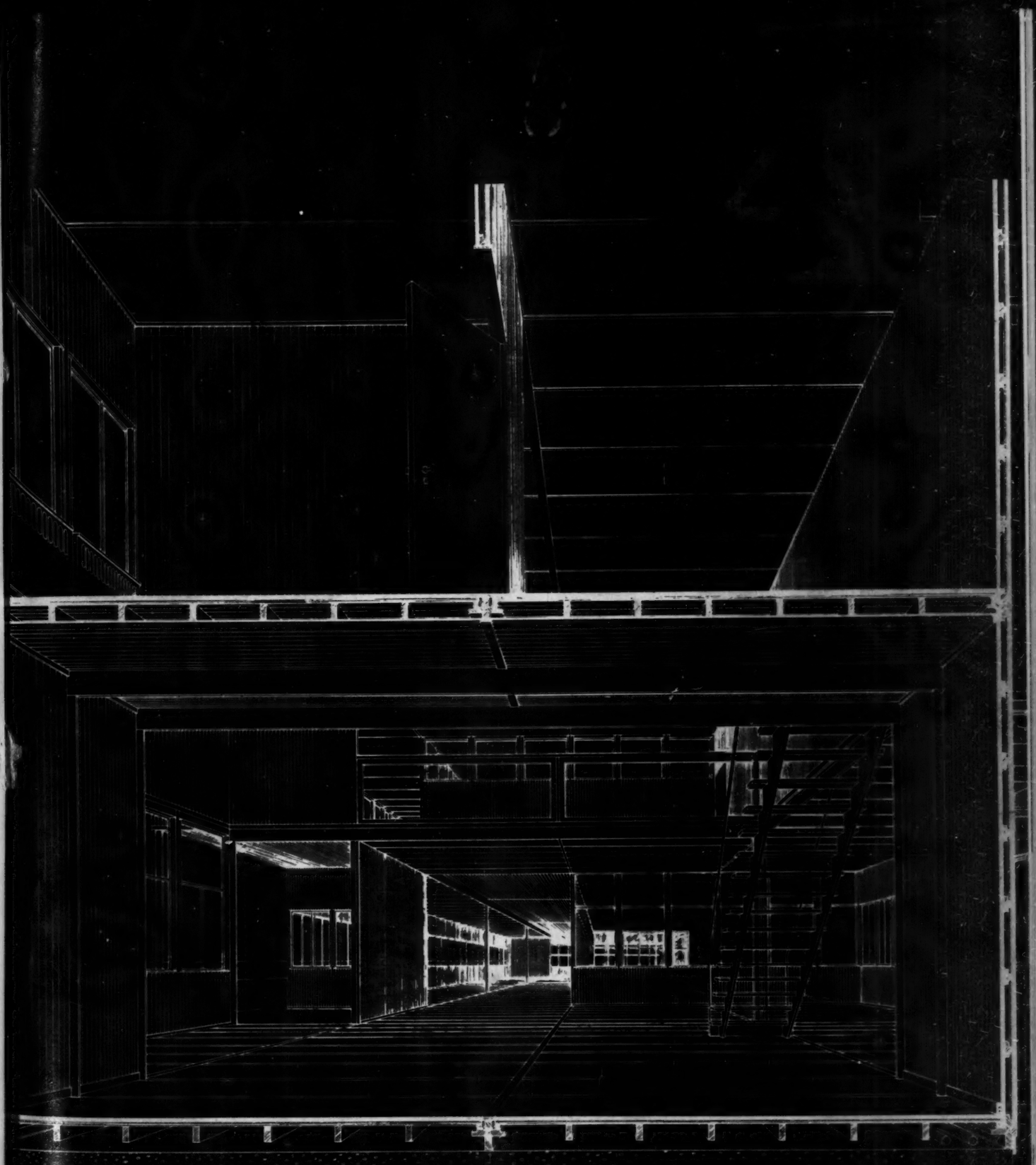

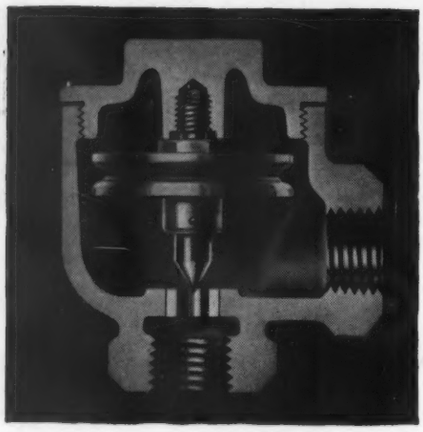

"Old Ironsides" winning war-time service stripes

Here is the record . . . Webster Steam Heating Equipment—using a minimum of critical metals and limited to essential sizes and models—is maintaining a 50-year record of superior heating results.

Chances are that you were a boy in short pants when Warren Webster pioneered the principles of modern steam heating. Since that time more than five million Webster Radiator Traps have been installed with this remarkable record—less than one-half of one per cent have been recorded as replaced for all causes.

We like to think of "Old Ironsides," the war-time Webster Radiator Trap, as literally "stripped for action." The design saves critical materials and machine-tool hours for direct war work. But, operating efficiency is unimpaired because "Old Ironsides" employs the time-tested Webster thermostatic element, a diaphragm of phosphor bronze fully compensated for pressure.

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Webster Steam Heating Equipment is being made for authorized war-time projects—Army hospitals, theatres and administration buildings; the Navy's fighting ships; war plants, shipyards, airplane hangers; and for essential heating repairs.

We are proud to play our part in keeping steam heating available for its essential role in war-time . . . and we are doubly proud of our Army-Navy "E" awarded to us for producing many times the originally contemplated maximum on our Ordnance contract for the United States Army.

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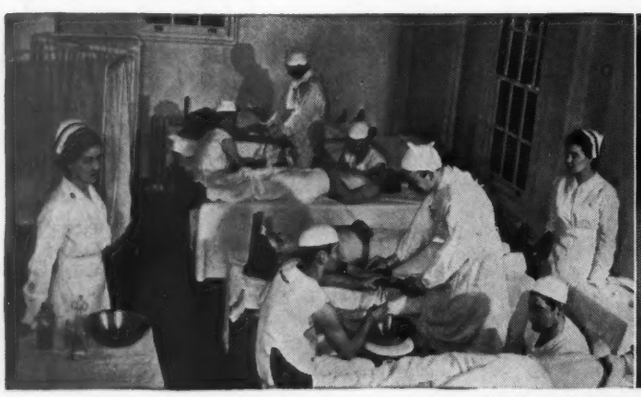

Official U. S. Navy Photo

Patients at U. S. Navy Hospital enjoy steam heating comfort

Official U. S. Marine Photo

U. S. Marines at "chow" in steam-heated mess hall

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ARMY E NAVY

Webster
Steam Heating

Architectural Library

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New Pencil Points, April, 1943

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4

THE ARCHITECT IN THE WAR PROGRAM: The California Chapter, AIA, has been markedly successful in helping architects to get war jobs; by Samuel E. Lunden, AIA 8

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Cover design, layout, and typography are by RUDOFSKY. Drawing on the cover is by Konrad Wachsmann, and shows some of the design possibilities of The General Panel Corporation's Packaged Buildings System. Drawings in the article, PREFABRICATION PATTERN, are by the author, Samuel Paul.

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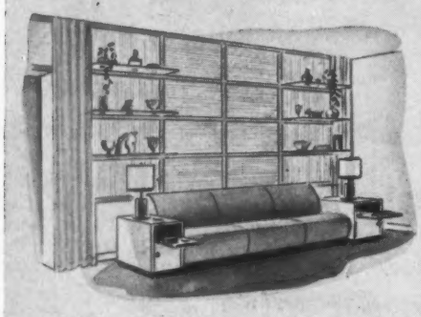

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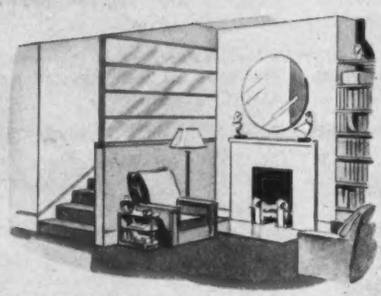

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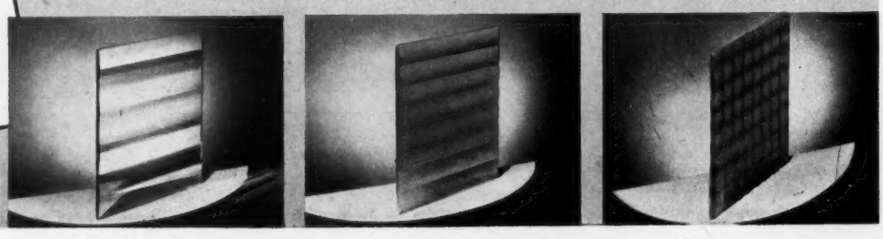
LOUVREX FLUTEX DOUBLEX



1st

Strong-Bilt Panels have been used to line the walls and ceilings of more war housing units, we believe, than any other material providing full-wall construction

THE SAVINGS in time and cost with maintenance of quality construction demonstrated on the building industry's great wartime proving ground are already being figured into many plans for postwar homes. Advantages apply to both conventional and prefabricated construction. Write for new informative booklets. The Upson Company, Lockport, New York.

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UPSON PRODUCTS

UPSON STRONG-BILT PANELS

The Architect in the War Program

by Samuel E. Lunden, AIA

The Southern California Chapter of The American Institute of Architects has been most active in helping architects to find themselves in these trying times. Here their President, Samuel Lunden, tells how the Chapter proceeded and what results they achieved. To us it seems a worthy example which Chapters, Associations, and groups elsewhere might well be proud to follow.—THE EDITORS.

ARCHITECTS PLACEMENT QUESTIONAIRE

The following form is intended to provide specific data for making a permanent analysis for those architects who are interested in getting into defense work.

Name _____ Age 48 Draft Status 45-65

Occupation Architect Yrs. Experience 12 Tel.No. Un 11493

Yrs.Drafting 16 Yrs.Shop Training ____ Yrs. Bldg. Experience 5

Yrs.College 2 Name of College U. of Minn. Course Architecture
1 ENG. (STRUCT) Ext. C.W. Cook.

MAJOR SKILLS AND PROFESSIONAL INTERESTS:

Check those items in which you have skill or special training. Double-check those in which you are best.

Drafting	✓✓	Weight Analysis	✓	Handling People	✓✓
Sketching	✓✓	Stress Analysis	✓	Labor Problems	✓
Perspective	✓✓	Structural Design	✓	Interviewing Vendors	✓✓
Ink Rendering	✓✓	Test Lab.Work		Interviewing Applicants	✓
Pencil Rendering	✓✓	Materials	✓	Supervising Contracts	✓✓
Color Rendering	✓✓	Writing Specifications	✓✓	Teaching & Training	✓
Model Building		Contract Work	✓	Checking Design	✓
Full Sizing	✓	Cost Analysis	✓	Checking Dimension	✓
Detailing	✓	Heating & Ventilating	✓	Planning & Scheduling Work	✓
Layout Work	✓	Electrical Wiring		Checking Details	✓

SCHOOL SUBJECTS AND SPECIAL TRAINING:

Check subjects that you have studied. Double-check those in which you are best.

Math	✓	Physics	✓	Hydraulics	
Algebra	✓	Mechanics	✓	Strength of Materials	✓
Geometry-plane	✓	Graphic Statics	✓	Metalurgy	
Geometry-solid	✓	Dynamics		1 Yrs.Mechanical Drg.	✓
Geometry-descript.	✓	Chemistry	✓	Yrs.Machine Drg.	
Geometry-analyt.	✓	Calculus		Slide Rule	✓
Trigonometry	✓				

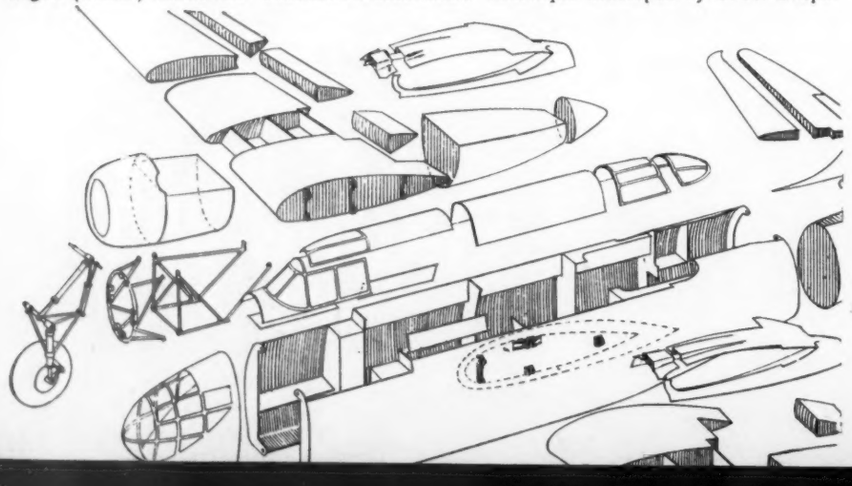
INDUSTRIAL KNOWLEDGE:

Check or double-check subjects of which you have a working knowledge.

1. Properties of materials ✓; heat treatment of metals ____; anodizing and plating ____.
2. Sheet metal blanking: shears ✓; nibblers ✓; saws ✓; routers ✓; drills ✓; punch press ✓.
3. Assembly methods: riveting and bolting ✓; assembly jigs and tools ✓; welding ✓; fits and tolerances ✓.
4. Production of preformed parts: Die-casting ____; forgings ____; castings ____; extrusions ____; hot pressing ____; moulded plastics ____.
5. Manufacturing sequences ____.

Fig. 1 (above) is a typical questionnaire which members filled in for analysis.

***Fig. 2** (below) shows the "Production Illustration" technique developed by C. H. Crispin*



When war struck suddenly on December 7, 1941, the architect, with other professional and business men, was put on his mettle to either "crawl into his hole" for the duration or prove that he could play as important and vital a role in war time as he had done in time of peace. There were men in the profession and others who believed that the architect was a luxury in peace time and a useless entity in time of war. With this thesis the writer takes violent issue. Basically, the architect is the most vital and important entity in the construction field. His value to the nation is even greater because of his broad background, his experience as an administrator, coordinator, and executive in addition to his purely technical qualifications.

Training for War Industries

Granted that the architect is qualified to serve actively in the war effort, the basic problem is how can he find the right job —the one in which he can produce the most toward winning the war. There has been much theorizing on this subject and many general suggestions have been made. Some are theoretically correct but lacking in certain practical fundamentals. The element of time and manpower, which are so important under the stress of war conditions, demand that specific men be trained for specific jobs, and not groups of men trained for theoretical jobs. Men trained for general jobs must be retrained for specific jobs. The latter method is a waste of precious time. The aircraft industries in Southern California either select the men for specific jobs and train them for these jobs in their own plants, or courses in universities are given to fit men for work in a particular plant for a specific job. Men showing above-average proficiency are sent to universities to take advanced technical courses which likewise have been designed to meet the needs of the particular plant in which they are to be employed. The training is with pay from the start.

The Institute—The Chapter—The Member

It is apparent that the problem becomes an individual one. It is necessary for each architect to find the place where he can make the best use of his natural ability, background, and experience. The average architect must work to earn a living. He can't afford to close his office and then start hunting for his niche in the war effort. There must be some way provided whereby he can familiarize himself with the opportunities offered while carrying on his diminishing practice. Naturally he turns to his own organization, The American Institute of Architects. The Institute through its Washington representative is active in behalf of every architect, but it cannot at a distance of several thousand miles and with a limited personnel take care of its members individually. Obviously, the architect must look to his own Chapter to help him in re-orienting himself to fit into the wartime picture. We can theorize on what the Chapter should do for its members, but here again time is of the essence and therefore actual accomplishment will perhaps be more helpful to Chapters now faced with this prob-

(Continued on page 10)

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Engineers know that a circular enclosure produces the maximum of strength per pound of material used. Likewise a Raymond pile not only produces the maximum strength but requires the minimum amount of steel. Steel is essential for carrying on war. How to conserve the use of this vital war material without sacrificing good engineering principles and structural strength is an important problem. Raymond's 46 years of technical experience, plus its practical knowledge in the design and construction of pile foundations enable us to suggest methods of using the minimum amount of steel to accomplish the desired results. On your next foundation project, consult Raymond and help to conserve WAR ESSENTIAL STEEL.

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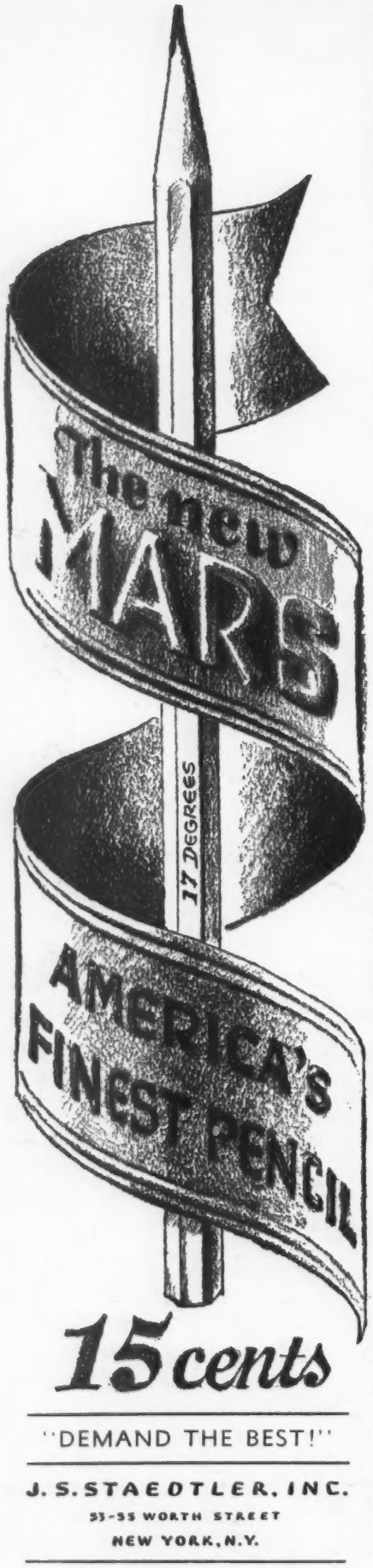

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53-55 WORTH STREET
NEW YORK, N.Y.

(Continued from page 8)

lem. The following is the inside story of the Southern California AIA program.

Establishment of Chapter Policy

The present administration of the Southern California Chapter of the American Institute of Architects took office about one month after war was declared. The Executive Committee felt that the Chapter should take an active part in the reorientation of its members so that they might serve the nation in a capacity which would enable them to utilize their particular abilities to the utmost. It was evident that private construction work would be out for the duration and that the amount of housing work and Army and Navy work available to architects would not justify the maintaining of offices on the part of the entire membership. Our first move was to put on a series of Chapter meetings designed to educate the members to the various opportunities in direct war effort, and to urge them to conserve their assets by closing their offices and entering into direct war effort, unless they had definite prospects for continuing.

Practical, helpful meetings were designed to give the members concrete information on war jobs. One Chapter meeting was addressed by Everett Harman, M.I.T. '22 in Architecture, consulting personnel adviser, and by a personnel director of one of the major aircraft plants. Mr. Harman analyzed questionnaires (Fig. 1) filled by members before the meeting and indicated that qualifications fell into the following classes: draftsmen, stress analysts, production engineers, administrators, liaison engineers, coordinations, research engineers, and plant maintenance engineers. The personnel director displayed detailed working drawings to indicate the character of the work turned out in aircraft plants. Actual types of work and rates of pay were indicated in response to questions from the floor. Information was given on courses of training which were being offered with pay.

(Continued on page 12)

SOUTHERN CALIFORNIA CHAPTER
AMERICAN INSTITUTE OF ARCHITECTS

March 30, 1942

WAR EFFORT
INFORMATIVE NO. 3

To Members and Associates

GENERAL OUTLOOK

The immediate future appears to be a bit brighter for the Architect in private practise in this area.

The Navy, within the past few days, has awarded Architect-Engineer Contracts to three of our members. Mr. Kistner has been awarded a large contract by the Navy at San Diego. The Navy has awarded Myron Hunt and Harold Chambers a cantonment contract involving quarters for 20,000 men.

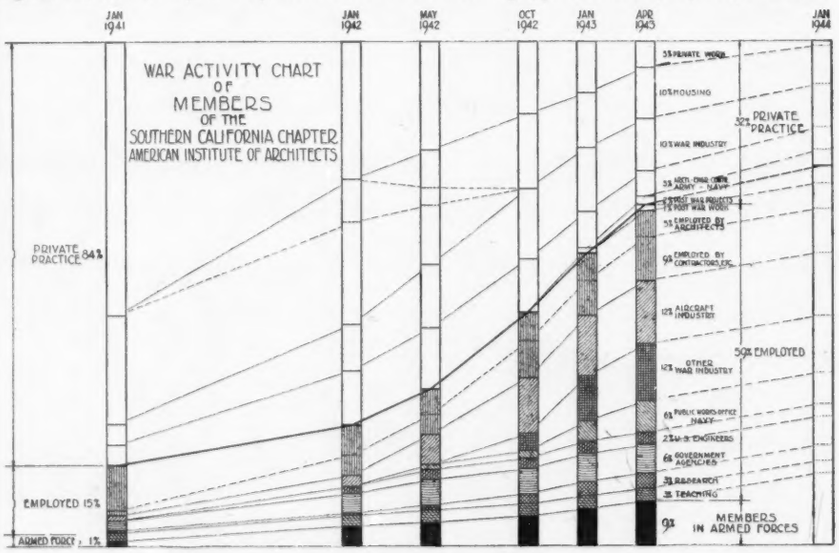
The U.S.Engineers have awarded an alien Reception Center project to Mr. Clements. Ben O'Connor is also associated with this job.

These are the first War Department and Navy Department projects awarded to Architects in this region for some time. We have every reason to believe that others will follow.

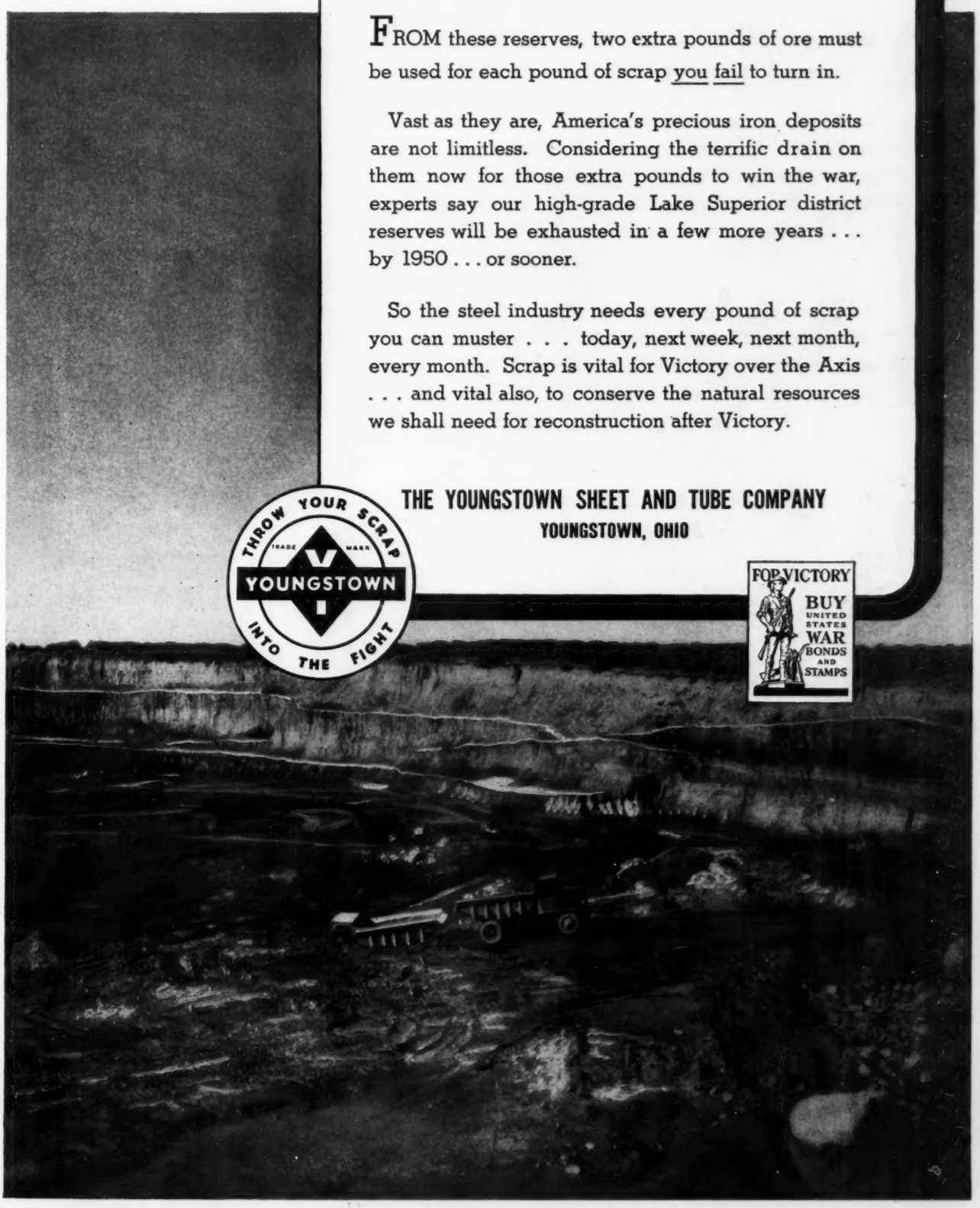
The housing project designed by Weston and Reichardt is virtually complete. That of Risley and Gould is under way. Adams and Lattas project is also under construction. Wilson and Criley's is being redesigned for a new site.

Fig. 3—Part of one of thirteen War Informative bulletins issued by the Chapter

War activity chart of members of the Southern California Chapter. Dotted lines under legend indicate work done by members on three housing types: low-cost, defense, and war.



YOUR *Scrap* CAN POSTPONE 1950



FROM these reserves, two extra pounds of ore must be used for each pound of scrap you fail to turn in.

Vast as they are, America's precious iron deposits are not limitless. Considering the terrific drain on them now for those extra pounds to win the war, experts say our high-grade Lake Superior district reserves will be exhausted in a few more years . . . by 1950 . . . or sooner.

So the steel industry needs every pound of scrap you can muster . . . today, next week, next month, every month. Scrap is vital for Victory over the Axis . . . and vital also, to conserve the natural resources we shall need for reconstruction after Victory.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
YOUNGSTOWN, OHIO

THROW YOUR SCRAP INTO THE FIGHT
TRADE MARK
YOUNGSTOWN

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

(Continued from page 10)

At another meeting one of our members, Charles H. Crispin, who had developed a technique known as "Production Illustration" (Fig. 2) at one of the aircraft plants, put on an exhibit and gave a demonstration of the processes involved, the knowledge of perspective being one of the basic requirements. An evening course, taught by Mr. Faxon, was offered at the University of Southern California. Some members took this course in Production Illustration. A number of our members took a three-months course in camouflage. Several have commissions to design and execute camouflage work for the Army, Navy, and war industries.

Our educational meetings were supplemented by Bulletins and War Informatives (Fig. 3) which kept the ever-changing picture before the members. The War Informatives, 13 of which were issued in 1942, were edited by the president and issued while the news was "hot". The members were thus kept informed from day to day of all developments affecting their practice and kept advised of opportunities in the war effort. By presenting the various approaches to the problem and stimulating the members to make plans for war effort jobs well in advance, no time was lost in making the transition. In some cases the members had to resign from their private projects in order to undertake opportunities in war industries which were offered to them. It is my belief that an active program which keeps the members alive to the issue can be carried on profitably by every chapter of the American Institute of Architects and that such a program will lead to definite results.

Members Resources Committee

Special executive committee meetings and luncheons were held, with high officers in various branches of the armed services present, for the purpose of developing good public relations and to present the qualifications of our members not only for commissions in the services but for architect-engineer contracts. An active group, known as the Members Resources Committee, tabulated the manpower, equipment, resources of our members (Fig. 4), summarized the dollar value of work done by the reporting offices. The report was sent to the United States Engineers and to the Public Works Office of the Navy, both locally and in Washington, with the request that our resources in experience, available equipment, and manpower be utilized on Army and Navy construction work. A number of our members have been active on architect-engineer contracts for the United States Engineers and the Navy. The work of this committee has produced results both directly and indirectly.

MEMBERS RESOURCES (Amended)

1. This data is tabulated from forty-five questionnaires returned, representing fifty-six members.
2. Tabulation of Work Volume:

	Government Agencies (Millions)	Private Clients (Millions)	Total (Millions)
1937-1941	$ 93,128	$125,514	$218,642
1927-1936	$ 46,615	$126,887	$173,502
1927-1941	$139,743	$252,401	$392,144

3. Total present office space—55,000 square feet.
4. Tabulation of personnel

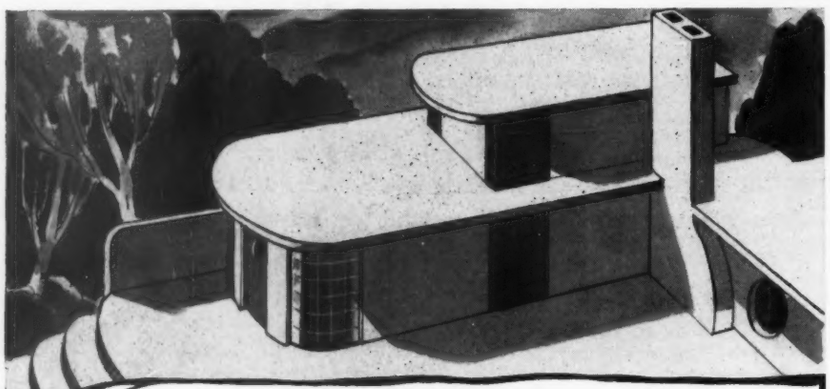
(a) Architectural	151
(b) Structural Engineering	60
(c) Mechanical & Electrical	46
(d) Civil & Landscape	54
(e) Specification Writers	13
(f) Estimators	7
(g) Inspectors	22
(h) Accountants	16
(i) Technical Stenographers	38
Total Technical Personnel	457

Fig. 4—Tabulation of data received from members of Southern California Chapter, AIA, on amount and type of work done, and personnel available for war work.

Chapter President's Office

The Chapter president's office soon became the headquarters of job inquiries from war industries, particularly aircraft plants, government agencies, architects and engineers in private practice, and from Chapter members. This made it possible to recommend particular members for specific jobs. Usually two or three names were submitted for the selection of the prospective employer. Every effort was

(Continued on page 14)



POST-WAR EXTERIOR WALLS TO BE OF
stucco—concrete—monolithic concrete
cement asbestos shingles
concrete slab—brick—lightweight
aggregate block—or equal
WEATHERPROOFED AND DECORATED WITH
MEDUSA PORTLAND CEMENT PAINT

Post-war planning indicates a widespread increase in the use of cement in exterior walls. Whether of stucco, concrete, cement asbestos shingles or masonry units, walls can be weatherproofed and decorated successfully with Medusa Portland Cement Paint. This special purpose paint has a Portland Cement base—the identical material used in the wall itself. That's why Medusa Paint bonds perfectly, making a hard, permanent, cement-like finish—a cement coating that weatherproofs the wall against the penetrating action of rain, wind and freezing temperatures and makes a colorful, washable finish. Medusa Paint is inexpensive in first cost, mixes with water and is applied to damp or dry, exterior or interior surfaces, in any of ten colors, black or white. Investigate the advantages of Medusa Portland Cement Paint. Write today for booklet, "Painting Concrete, Stucco, and Masonry."

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In addition, these units produce a permanent, low-maintenance system while using critical materials amounting to only 15% to 20% of their total weight . . . And they require for shipment only 20% to 25% of the space in available gondola cars that would be required for an equal footage of other types of conduit construction. • Speed is the essence of wartime construction—and Ric-wiL Prefabricated Pipe Units have proved a definite aid.

When Makeshifts Won't Do—**RIC-WIL**

Architects, Engineers and Contractors on war projects will find much helpful information in the Ric-wiL Engineering Data Book. Write . . . on your letterhead . . . for a copy.

RIC-WIL CONDUIT SYSTEMS FOR UNDERGROUND STEAM
THE RIC-WIL COMPANY • CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES

(Continued from page 12)

made to place men who need the jobs the most. Responses to questionnaires sent out periodically by the Members Resources Committee gave an up-to-date picture of what each member was doing and whether he intended to keep his office open or not.

Armed Services

A special questionnaire was sent out to determine how many members were interested in commissions and to determine which branch they preferred. The results were tabulated and personally presented to the District Engineer and to other procurement officers by the president of the Chapter. The qualifications of individual members were frankly discussed with these officers. As a result of these conversations many applications were submitted through the office of the president, others directly to the services by the members.

War Industries

Similar methods were used in dealing with the aircraft industries. A number of telephone calls were received for architects to start as draftsmen at rates approximating 65 cents per hour. It was obvious that a selling job had to be done by educating personnel managers to the fact that architects had abilities other than drafting. At a luncheon meeting arranged with the personnel director of one of the larger aircraft plants, the entire background, education, and experience of the architect were laid on the table with all cards face up. Following this meeting a request was made to recommend a number of our members to the personnel director for consideration with the qualifications being sent in through the office of the Chapter president. It was agreed that the starting rate would be, not 65 cents per hour, but $1.24 per hour based on a forty-eight hour week, with time-and-a-half for hours over forty, making a starting salary of $65 per week. The application of each member was sent to the personnel director with a letter of transmittal by the Chapter president outlining the applicant's peculiar abilities, character, and general qualifications. A number of members were recommended and practically all were accepted. Two of our members have shown such proficiency that they have been sent to Stanford University for specialized training in aircraft engineering. Other companies soon followed in offering better opportunities for architects.

Direct Contacts

It is not intended to give the impression that the Chapter has been responsible for the placing of all of its members in the war effort. On the contrary, the majority of our members now engaged in war effort have made their contacts directly with the departments of companies with which they are connected. Allow me to cite a specific example: One of our members, Robert Alexander, made direct contacts with aircraft plants for the purpose of obtaining a job where he could learn all about the operation of a plant. He became staff assistant and was given organization and coordinating assignments in the production control department of one of the major aircraft plants. Recently this plant decided on a program of decentralization for the purpose of utilizing available labor in outlying communities. Mr. Alexander was given the job of organizing and operating the production control for the movement of material between the home and branch plants. In less than six months of service he has been promoted to division supervisor in charge of interplant production control. Not only is Mr. Alexander playing a vital part in the war effort but he is preparing himself for the postwar world and the live production methods which will certainly be applied to the Construction Industry.

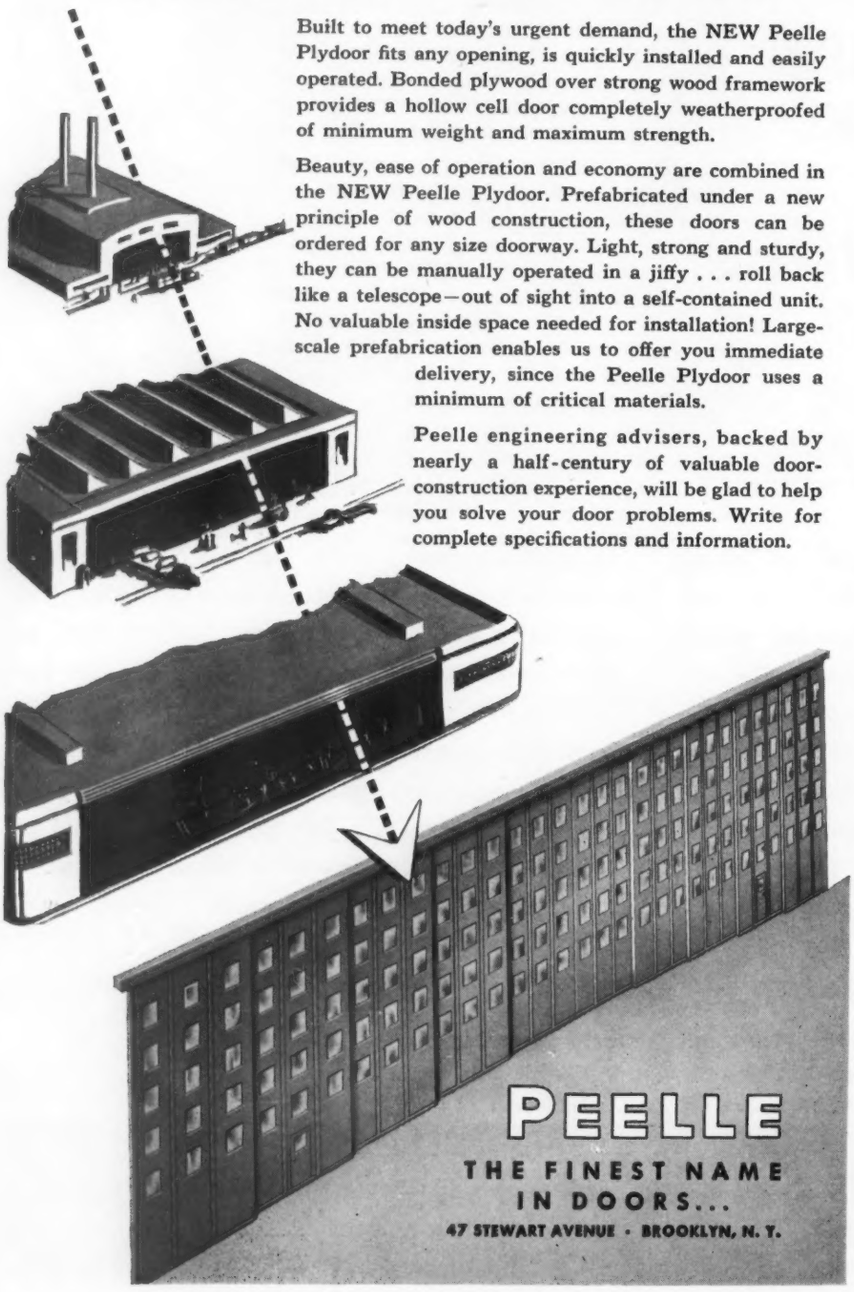
The Architect—"Tombstone Designer"

Referring to the Army Manual for Commissions we find only one classification for architects; Code O.P.53, "Graves Registration and/or Memorial Officer", wherein he is defined as a Designer of Tombstones. No doubt he is a designer of tombstones—*for the enemy*—because the vital role he is playing will do much to speed victory. Permit me to give you a picture of another member of our Chapter of whom we are very proud—*a designer of tombstones for the enemy*. Brigadier General Henry C. Newton, of the Armored Forces. For twenty years General Newton carried on his practice by day

(Continued on page 16)

You supply the doorway

PEELLE HAS THE DOOR



Built to meet today's urgent demand, the NEW Peelle Plydoor fits any opening, is quickly installed and easily operated. Bonded plywood over strong wood framework provides a hollow cell door completely weatherproofed of minimum weight and maximum strength.

Beauty, ease of operation and economy are combined in the NEW Peelle Plydoor. Prefabricated under a new principle of wood construction, these doors can be ordered for any size doorway. Light, strong and sturdy, they can be manually operated in a jiffy . . . roll back like a telescope—out of sight into a self-contained unit. No valuable inside space needed for installation! Large-scale prefabrication enables us to offer you immediate delivery, since the Peelle Plydoor uses a minimum of critical materials.

Peelle engineering advisers, backed by nearly a half-century of valuable door-construction experience, will be glad to help you solve your door problems. Write for complete specifications and information.

PEELLE

THE FINEST NAME IN DOORS...

47 STEWART AVENUE · BROOKLYN, N. Y.

UNDER THE NATION'S ROOF

April, 1943

There is nothing in War Emergency restrictions or regulations to prevent specifying - and getting - the type of built-up roof your project requires and your judgment dictates. Use coal tar pitch and tarred felt with gravel or slag surfacing on flat areas and any of several sound asphalt or asbestos variations on steep or free-drainage surfaces.

There is an erroneous impression that asbestos fibers are not available for asbestos roofing materials. This is not so. All customary weights of asbestos roofing felts can readily be obtained.

The WPB standardization program as regards roofing felts simply eliminated some trimmings. The customary and time-tried weights and qualities remain.

Blisters on smooth surfaced asphalt or asbestos roofs. Ruberoid PERFORATED asbestos or asphalt felts have practically solved this problem. The tiny perforations permit the escape of blister-forming vapor during application at the same time permitting the cementing asphalt to bleed through and grip the felt firmly.

Sheet Metal Replacements. Ruberoid's new asbestos-cement board, Stonewall, replaces sheet metal for Heating and Air-Conditioning Ducts and similar construction where fire- moisture- and rust-proof material is needed. Easy to work - you can nail it, saw it, score it, drill it. No painting is required. Strong, durable, low in cost.

Good roll roofing will last for years when properly applied on steep surfaces. Seam leaks often appear early due to loosening nails. Ruberoid now equips certain grades of roll roofing with an ingenious and permanent tape device called the Eason Flap which effectually seals the nails away from the weather and keeps seams tight. Eason Flap Roofing is still available for Government jobs.

Puzzled over wall flashing design when you can't use your customary sheet metal detail? Ruberoid has 5 types of flashing without metal - all practical - all simple to install by a competent roofer.

The RUBEROID Co.

For up-to-the-minute information on your roofing and building problems consult our nearest sales office:

NEW YORK—500 Fifth Ave. • CHICAGO—307 North Michigan Ave. • BALTIMORE • ERIE • MILLIS (Boston) • MINNEAPOLIS • MOBILE

(Continued from page 14)

and his work with the National Guard by night. A major when World War II broke out, he asked for transfer to the Armored Forces. At the training school he received the highest honors in the examination in competition with men from all branches of the service and of all ranks. He was put in charge of the Officers Training School and has advanced rapidly to his present rank of Brigadier-General.

The Architect—A Leader

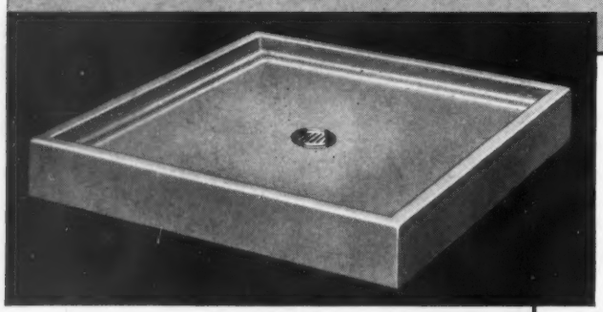
Government agencies look to the architect to fill positions of responsibility. When the NHA was organized one of our members, Eugene Weston, was selected as Regional Representative of Commissioner Blandford. He is doing an outstanding job in this vitally-important war job. Many other examples could be cited to show that the architect, by virtue of his broad background and training as an administrator, coordinator, and executive, is peculiarly qualified to assume leadership in times of emergency.

Recapitulation

The re-orientation of the architect to fit into the war picture is not a mass problem, it is an individual one. The Chapter of the Institute, through an educational and public relations program, can be of great assistance in solving the individual architect's problem. If the average architect will take the time and make the effort he will find a place in the war program comparable to the position and standing he held in private practice. The results of such a program will be in direct relation to the effort.

New

PLASTEX RECEPTOR
FOR
WEISWAY CABINET SHOWERS



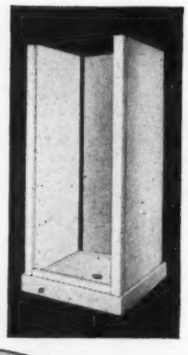
Molded under high pressure, of chemically blended materials, Weisway's exclusive Plastex Receptor is light in weight, strong, durable, sanitary.

★ The Weisway Model V Deluxe Cabinet Shower—an outstanding improvement in bath facilities for war housing—contains less than one pound of critical materials!

The new Plastex receptor, processed of chemically blended materials, is a hard, close grained unit. Much lighter in weight than pre-cast concrete, it is stronger and more durable... easier to handle and install... affords greater comfort, safety and beauty. Standard color is attractive, non-fading pastel green.

Accurately prefabricated, designed for quick, labor-saving assembly on the job, Weisway Model V is available through regular plumbing channels, in single units or quantities for all war housing, new and remodeled. Write now for specifications and details.

HENRY WEIS MFG. CO., INC. (Est. 1876)
421 Oak Street, Elkhart, Indiana



★
Weisway Model V Deluxe is easy to erect, provides complete, leakproof self-contained bath facilities.
★

WEISWAY
Cabinet Showers

"QUOTES"

Postwar Schools

Perhaps the most noticeable change in school buildings built after the war from the layman's point of view will be in exterior design. Undoubtedly, there will be a strong tendency toward what we have come to understand as modern architecture. Not necessarily modernistic design—there is a marked difference—the former a simplified and dignified design, the latter a forced style as unnatural and as illogical for modern school buildings as the gothic or classic styles. . . . The greatest contribution that modern architecture has made to school design is to show that maximum beauty in architecture can be gained through simplicity of line, plain surfaces, and attractive colors, rather than expensive architectural ornamentation.

Community requirements for summer playgrounds and adult recreation, as well as the schools' requirements for programs in physical education are rapidly teaching the public the need for larger school sites. . . .

It seems crystal clear that school buildings must be planned more than ever for pupil activity in every classroom, shop, auditorium, library, and playground. The future building is to become an educational workshop, not only for those within school age, but for the entire community. The public is going to demand of teachers that they be conversant with the application to everyday life of the tables, rules, and dates that so frequently have been taught as such, with no related connection with the lives of either pupils or adults, and it is going to insist that buildings furnish the appropriate setting for this improved type of instruction.

We can anticipate almost for a certainty another federally-sponsored, public works, school-building program. We may hope that both local school districts and federal authorities will correct the errors committed in our first experience of that sort.

The first step, therefore, in planning the best buildings for the future will be cooperative and careful planning well in advance of actual construction. The number of architectural firms in the entire United States, qualified by experience and educational interests to develop new plans and designs to meet the needs of future schools in a manner that takes full advantage of the functional use of new methods and materials, is very limited and the work of these architects, as well as that of others will profit immeasurably by time for adequate study.

Another improvement in the problem of postwar schoolbuilding planning, and one that we predict with less confidence, is greater freedom from the many obsolescent and out-moded state school-building codes that so frequently hamper architects and school officials.

WARREN S. HOLMES and
ARTHUR R. SHIGLEY

Discussion of School Buildings After the War. Reprinted from Michigan Society Bulletin.

THESE ARE TIMES THAT PROVE THE WORTH OF GOOD MATERIALS

YOU CAN DEPEND ON COPPER AND BRASS

Wherever guns are firing, wherever planes are flying—American fighting men are proving the worth of copper and brass. Finer ammunition because of it . . . better ships . . . more effective planes . . . more efficient tanks . . .

It's true of the home front, too. Copper and brass-pipe plumbing is proving its worth again and again in long-lasting rust-proof, trouble-free service. Likewise copper sheet metal work . . . bronze screens . . . wherever copper is in use.

As an architect, you can be proud of the many times you wrote "Anaconda or equal" into pre-war specifications.

With you, we are looking forward to victory and to peacetime building on a scale never before achieved in America. Anaconda Copper and Brass will be ready for your blue-prints . . . in even wider fields of application, usefulness and economical maintenance. 4329

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Subsidiary of Anaconda Copper Mining Company
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ANACONDA
From mines to consumer

Anaconda Copper & Brass

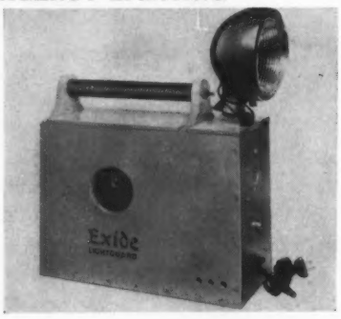
Products Progress

(The columns of this section are open to any manufacturer who has a new product of interest to the architectural profession. Manufacturers who wish to have their product shown should send a glossy photograph, together with information covering the function, characteristics, installation, cost of the product, and a description of what AIA literature is available.)

BUILDING BOARD

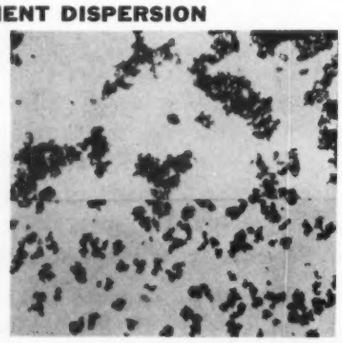
Stonewall asbestos-board, product of Ruberoid Co., 500 Fifth Ave., New York, is made of asbestos fiber and Portland cement. It is said to be fire-, rot-, vermin-, and rustproof, needs no paint. Available in standard sheets 4'x8', and three thicknesses—3/16", 1/2", 3/8". Readily sawed or scored, drilled and nailed.

EMERGENCY LIGHTING



The Lightguard, a self-contained emergency lighting unit, needs no fixtures or wiring other than plug-in connections to AC supply, throws a light beam 150-200', covering a 7500 sq. ft. area. When lights go out and machinery runs on momentum, the unit automatically switches on. Electric Storage Battery Co., 19th St. and Allegheny Ave., Philadelphia.

CEMENT DISPERSION



Use of Santorized Trimix Liquid is said to reduce up to 20% of the normal amount of gauging water in Portland cement mixtures, due to principle of greater wetting by means of additives having great surface activity. Trimix dispersion shown in lower photo. L. Sonnenborn Sons, Inc., 88 Lexington Ave., New York.

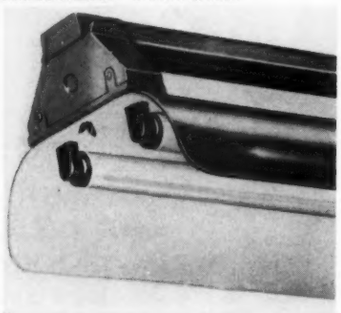
VENTILATORS

Though WPB has forbidden the general use of metals in roof ventilators, it has permitted the manufacture of metal ventilators for "essential applications," where necessary because of intense heat, corrosive fumes, etc. The Swartwout Co., Cleveland, has a line of new NCM roof ventilators, made of non-critical materials. Metal used for bracing and assembling amounts to less than 5%.

FLUSH VALVE

The Victory flush valve from Sloan Valve Co., Chicago, has new parts of plastics and malleable iron and a net copper content of less than 4 ounces. The all-plastic vacuum breaker affords visual inspection. The plastic lining provides a smooth, corrosive-resistant surface with which the piston comes in contact.

FLUORESCENT FIXTURE

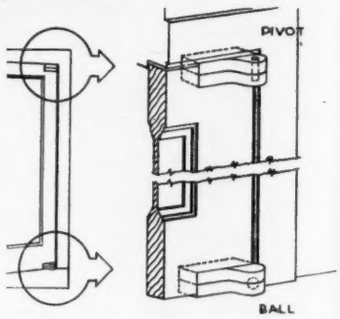


New Mitchelite unit has easy-fit wireway channel to simplify wiring and mounting for continuous rows. Reflectors are non-metal Lumenite—non-corrosive, heat resistant. New type wireway permits locating ballast on "ouside." Starters, sockets, easily accessible. Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago.

MASONRY PROTECTIVE

Colorthru, a finish coat in color for masonry, made by Colorthru, 20 W. 45th St., New York, needs no priming or undercoat. One coat brushed or sprayed on floors and walls penetrates and waterproofs concrete, brick, stucco, cement, etc. One gallon covers 400 sq. ft. Available in tile red, brown, black, white, medium green ,battleship grey, universal grey. May be applied to old or new masonry, even when wet.

WOOD HINGES



Wood hinges developed by Whitehouse Research Bureau, 101 Park Ave., New York, eliminate metal for war use. Hinges are inexpensively installed. Impregnated pivot avoids squeaks, while a glass ball carries the door weight. Hinges may be painted or stained to match the door. Wood is kiln-dried, hard maple or birch.

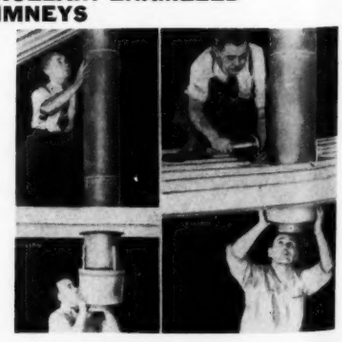
ELECTRIC WIRE

A new way to save rubber and tin has been developed by National Electric Products Corp., Pittsburgh. Its new type of electric wire, with all critical materials deleted from the covering, leaves only the copper conductor itself of a vital nature. The new non-critical wire covering is said to conform to all stringent requirements of fire and moisture resistance necessary for building wire.

PLASTIC PIPE

A flexible, lightweight plastic pipe, said to resist corrosive action of oil, soap, chemicals, and moisture, has been developed by Dow Chemical Co., Midland, Mich. Saran plastic pipe can be welded, heated, bent, and threaded. To weld, melt ends slightly on hot plate, press together, allow to cool for a few seconds. Sizes up to 2" diameter now available. Flanges also available for this size.

PORCELAIN ENAMELED CHIMNEYS



Vitroliner chimneys are quickly assembled on the site by two men. The vitreous enamel flue is encased in asbestos insulation. Pipe is made in 3"-10" stock sizes. Constructed to prevent leakage and damage to roof flashing. Condensation Engineering Corp., 2515 Archer Ave., Chicago. For use with oil, coal, or gas heating equipment.

WARSPEED WITH 'INCOR' POINTS WAY TO EARLIER USE AT LESS COST

SPECIFY
'INCOR' 24-HOUR CEMENT
FOR

EARLIER OCCUPANCY IN
BUILDINGS OF ALL TYPES

WATERTIGHT CONCRETE—
BASEMENTS, TANKS, STUCCO, ETC.

CONCRETE FLOORS—HEAVY-DUTY,
NON-DUSTING—READY FOR
SERVICE IN 24 HOURS

DESIGNERS and builders are setting new time and cost records with 'Incor' 24-Hour Cement. To produce invasion barges used at Guadalcanal, in Africa and elsewhere, Higgins Industries, Inc., built the largest plant of its kind at all-out speed.

In column and beam construction, 'Incor' provided dependable service strengths in one day, saving 4 to 6 days on each pour, and advancing completion by many weeks. 'Incor' was also used for heavy-duty concrete floors. As plant erection progressed, keels were laid on the freshly-placed concrete 24 hours after the finishers left it. With line-production precision, barge building followed right behind floor construction. Over 1000 barges were turned out while the plant was being built. Typical 'Incor' warspeed performance.

'Incor' opens up many new possibilities for the architect. Consider what it means to pour 'Incor' concrete one day, strip clear the next . . . no reposting to interfere with mechanical trades . . . faster construction schedules with 50% to 60% less forms. Weeks saved—earlier occupancy at less cost.

Take these advantages into account in planning your next project—housing, hospitals, schools, industrial buildings. Specify 'Incor',* America's FIRST high early strength Portland cement. Get quality concrete—save your client money as well as time.

*Reg. U. S. Pat. Off.

LONE STAR CEMENT CORPORATION

Offices: ALBANY • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS.
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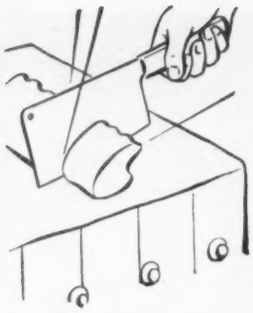
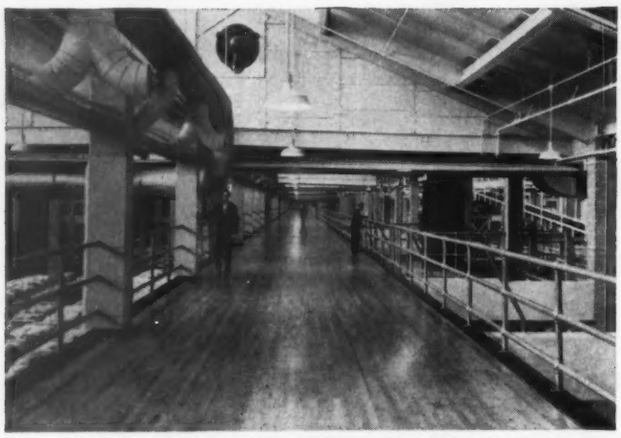
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25-MILLION BARRELS ANNUAL CAPACITY



BUTCHER BLOCK STAMINA

for Heavy-Duty Floors



National Biscuit Company, Atlanta Bakery floored with Northern Hard Maple. Photo, courtesy G. H. Tennant Co., Minn. Louis Wirsching, New York City, Architect.

Tough-Fibered, Tight-Grained Clean HARD MAPLE!

Watch your butcher working at his block! Those guillotine blows of his heavy cleaver are falling on Northern Hard Maple, the wood that's tough enough to "take it" and stay clean, wherever used and however hard the job.

Put the same tight-grained material in any floor subject to very heavy use. Add to it all the punishment such floors usually get! Hard Maple will easily stand up under it, over year after year of bright cleanliness, comfort under foot, and low cost of upkeep. Traffic moves safely, easily over Hard Maple's velvet-smooth, non-slippery surface.

There are so *many sound, logical reasons* for Northern Hard Maple floors in food plants, textile mills, stores, schools and other type buildings, including housing, that there is *good reason* to consider it first, for remodeling and reconstruction jobs. Hard Maple is available in strips or blocks. See Sweet's, Sec. 11/57.

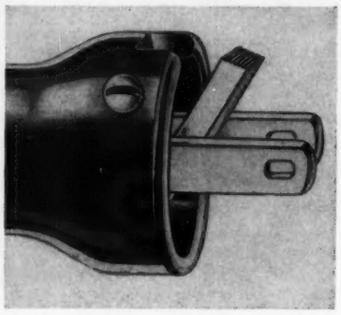
MAPLE FLOORING MANUFACTURERS ASSOCIATION
1785 McCormick Building, Chicago, Illinois

Write for illustrated literature featuring grades, specifications, etc.

Floor *with*
MFMA Maple
REG. U. S. PAT. OFF.
(NORTHERN HARD)

(Continued from page 20)

CIRCUIT BREAKER PLUG



The Hopax circuit breaker plug provides protection for motors, power tools, fluorescent units, etc., from overload or short circuit. The plug automatically disconnects the faulty piece of equipment from the circuit. A small lever (shown upright in illustration) breaks connection. The plug is actuated by heat. Hopax Industries, Inc., 1 N. LaSalle St., Chicago.

DRUM TRAP

This drum trap is not subject to priority restrictions. The threaded cover and ring is die-cast of hard lead and the ring is welded to the trap body instead of soldered as was the case with the brass cover. The opening is large enough to provide access to the trap if necessary for cleaning, and the threads, being comparatively coarse, are easily engaged. Threads are iron pipe size to allow easy straightening if the ring should be damaged. Lead Industries Association, 420 Lexington Ave., New York.

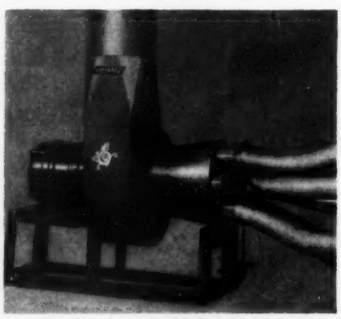
GYPSUM EXTERIOR BOARD

Certain-teed Products Corp., 120 S. LaSalle St., Chicago, has added Bestwall gypsum exterior board to its line of non-critical materials for wartime construction. The board is said to have practically no contraction or expansion, is termite resistant, and will not buckle, warp, or open at joints. Bestwall is a combination of a fireproof core of gypsum rock and a durable, weather-resistant surface of asphalt roofing. Panels are ½″ thick, with square edges for vertical application; and 1″ thickness, with shiplap edges for either vertical or horizontal application. Panels are 24″ wide, in 8′, 9′, 10′ lengths.

WOOD VENTILATOR

A new wood ventilator developed by Weyerhaeuser Sales Co., St. Paul, Minn., to be made economically by woodworking plants from short pieces of standard lumber with jigs to be made available for the process. The type of base used makes it possible to adjust the ventilator to the roof pitch. Inside diameters: 12, 16, and 21″. When the wind is caught by the louvers on the windward side a swirling motion is produced within the ventilator, and exhausted on the leeward side.

FUME EXHAUSTER



Feature of this newly-developed fume exhauster is that fumes, gases, dust, filings, etc. do not come in contact with the motor. The centrifugal type blower wheel is made of ⅛″ steel. Framework has handles for carrying. Adapters are interchangeable and can be used for suction or blowing, as desired. Chelsea Fan & Blower Co., Inc., 1206 Grove St., Irvington, N. J.

STEAM GENERATOR

Compact steam generator needs only fuel and water for automatic operation. A new principle of water feeding automatically, and without use of thermostats or motor-driven pumps, furnishes feed water in direct proportion to the amount drawn off as steam. Super Mold Corp., Lodi, Calif. No fire boxes or electrical connections need be installed.

THEY SAY . . .

"History is merely gossip."
—*Oscar Wilde*

—That the furnace of the future will look like an icebox if present plans of two University of Illinois Engineers—J. R. Fellows and J. C. Miles—materialize. The inventors have developed a unit which produces as much heat as the conventional types but saves more fuel. The unit burns the cheapest grades of coal without smoke.

—That while Federal departments and the Armed Forces are still raising official eyebrows at the qualifications of architects, American-born Japs are being accepted in the Army and Navy, and the Waacs are hunting for Nisei girls who want to join up.

—That the increase in alarm clock production is an indication of things to come. The government is expected to relax restrictions not only on baby buggies, ranges, and furnace conversion equipment but also on construction which can soon look forward to authorization of more home building.

—The Office of Civilian Supply, contending that home front services as well as supplies are necessary to the war effort, will ask for an increase in the production of replacement parts for household equipment.

GUGGENHEIM WINNERS

New York—In the recently-issued list of awards of Guggenheim Fellowships are the names of Donald Harcourt deLue, sculptor, for work on sculpture depicting the heritage of America, and Eric Mendelsohn, Architect, who will write a book on "A Contemporary Philosophy of Architecture," in the nature of an architect's contribution to the spiritual guidance of the world.

BLANDFORD TELLS PROGRESS OF HOUSING CONSTRUCTION

79,800 UNITS FINISHED, 109,200 STARTED DURING JAN.-FEB., 1943

Washington—During the first two months of 1943, 79,800 war housing units were completed and 109,200 were started, NHA Administrator Blandford announced recently. The figures include both privately-financed and government-financed construction. Private building started 17,200 units, completed 23,000. Construction of war housing is carried out under local quotas established by the NHA and no new housing is authorized in localities where the WMC finds in-migration of war labor unnecessary or sufficient accommodations available.

In developing its local war housing quotas, NHA schedules privately-financed construction, if the units can be permanently absorbed by the community and if private builders can meet necessary wartime requirements. If private financing cannot handle the job because of occupancy conditions or temporary construction, NHA specifies government financing, and the projects are built by private contractors.

Recent NHA amendments will make insured financing available for about 90,000 more privately-built units, and increase FHA's war housing mortgage insurance authorization by $400 million and extend FHA's authority to insure such mortgages to July 1944.

The increase in insurance authorization relates only to the financing of NHA's current program. Estimates are now being analyzed to determine what additional war housing construction will be required to meet in-migrant housing needs after July 1.

Price Control

Most parts of the construction industry not already exempt from price control will soon be removed from regulation, OPA Administrator Brown announced, since most of the industry is now active in military construction and other government building activities which have been exempt from regulation.

CMP RATINGS FOR HOUSING

Washington—Procedures for the assignment of preference ratings and the allotment of materials for privately-financed war housing construction under the Controlled Materials Plan have been established by WPB and the NHA. Under the CMP, authorization to obtain controlled materials will be handled by the various claimant agencies to whose jurisdiction the projects have been assigned.

Under this plan, therefore, the NHA, as claimant for the war housing program, will assign preference ratings and allot controlled materials in connection with the processing of applications for privately-financed housing construction.

Paving the way for establishment of these procedures is a new order, P-55-b. This order is similar to Preference Rating Order P-55, as amended, the preference rating order issued for residential construction, except that certain changes have been made in order to adapt the administration of the war housing program to the CMP.

Consumers of materials must file a PD-105 form, the application form used for residential construction, and a PD-105A form which contains a materials list. Consumers are then granted a P-55-b order which authorizes the beginning of construction, provided that only those materials are used which have been approved on the materials list. To obtain materials, consumers must submit to the NHA Form CMP-H-1

(Continued on page 26, column 4)

NONINDUSTRIAL WAR CONSTRUCTION

Cumulations are from June 1940

	Commitments as of Jan. 31, 1943	*Completions as of Jan. 31, 1943*	*Value completed during Jan. 1943*	*Value completed during Dec. 1942*
		(Millions of dollars)		
Total Government-financed	[1] $15,957	$11,375	$585	[r] $625
Military	14,149	10,360	520	[r] 561
Housing and public works	1,808	1,015	65	64
Privately-financed war housing	1,258	955	45	56

[1] Total as of Dec. 31, 1942, revised to $15,565,000,000; military revised to $13,789,000,000, and housing and public works revised to $1,776,000,000.

[r] Revised.

Courtesy, Office of War Information

PREFAB COURSE GIVEN

Chicago—A research course in prefabrication is currently being given at the School of Design in Chicago, 247 E. Ontario St., Chicago. The course of study will discuss the development of the prefabricated and demountable house together with its analysis and possibilities. The course, which began on February 18, is in charge of George Fred Keck, head of the school's architectural department, assisted by Robert B. Tague.

CLINTON HILL HOUSING TO OPEN SOON

Brooklyn, N. Y.—Three units of the Clinton Hill housing project, developed by Equitable Life Assurance Co., will be ready for occupancy by June 1. The units, 12-14 stories high, will house 310 war workers' families, are part of a development which will eventually house 1200 families. Architects for the project are Harrison, Fouilhoux & Abramovitz. (Typical units, and a perspective of the project, were shown on pages 148-149, March, 1942 issue, NEW PENCIL POINTS.)

KINLEY FELLOWSHIP TO BE AWARDED

Urbana, Ill. — Candidates for the twelfth annual Kate Neal Kinley Memorial Fellowship are now being considered by the committee in charge. The Fellowship yields $1000 which is to be used by the recipient toward defraying the expenses of a year's advanced study of the fine arts in America or abroad, and is open to graduates of the College of Fine and Applied Arts of the University of Illinois and to graduates of similar institutions of equal educational standing whose principal or major studies have been in either music, art, or architecture (design or history).

Further information may be had from Dean Rexford Newcomb, Room 110, Architecture Building, University of Illinois, Urbana, Ill. Applications should reach the Committee not later than May 1.

HOUSING FOR CHICAGO

Chicago—The National Housing Agency has authorized $20,000,000 of residential construction for the Chicago metropolitan area in a recently-announced interim quota. The authorization will provide 3,000 new homes and 2,000 remodeled units. The quota, first released by NHA since last October for new construction, will provide housing for war workers on the edge of the metropolitan areas. WPB regulations limit the cost of each home to $6,000, and the ceiling on remodeling will be about $1,000. NHA officials point out that the construction will be financed by private funds, with FHA funds available to builders who need financing.

JEFFERSON MEMORIAL TO BE DEDICATED

Washington — The Thomas Jefferson Memorial, designed by John Russel Pope Associates, Otto R. Eggers and Daniel Paul Higgins, architects, will be dedicated here on April 13. Based on the Pantheon form, the edifice is chiefly of marble. The statue of Jefferson, standing under the domed ceiling, is the work of Rudolph Evans, New York sculptor. The sculptored group on the pediment was done by Adolph A. Weinman, of New York. Landscape treatment, in keeping with the simplicity of the surroundings, was designed by Frederick Law Olmsted, Brookline, Mass.

NEW YORK CITY PLANS POSTWAR HOUSING

New York—In his recent annual message to the City Council, Mayor LaGuardia stated that the City's low-cost housing program is keeping up to schedule, and that immediately following the war the City will be able to begin construction. Eight housing projects have been authorized and planned at an estimated cost of $61 million. This is in addition to housing which has been authorized but on which planning has not yet commenced.

CMP RATINGS

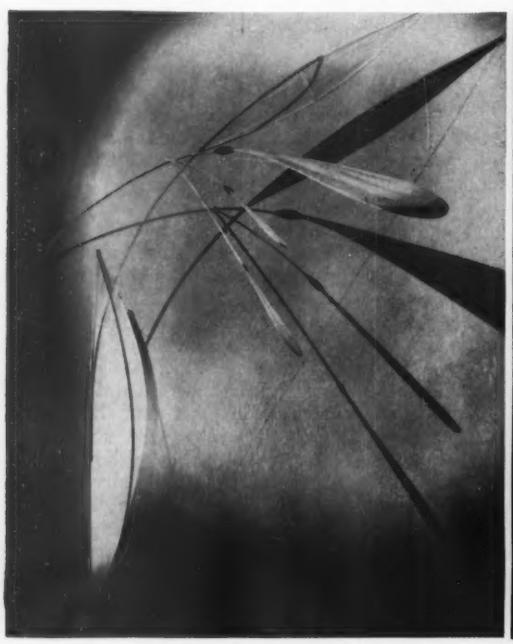
(Continued from page 1)

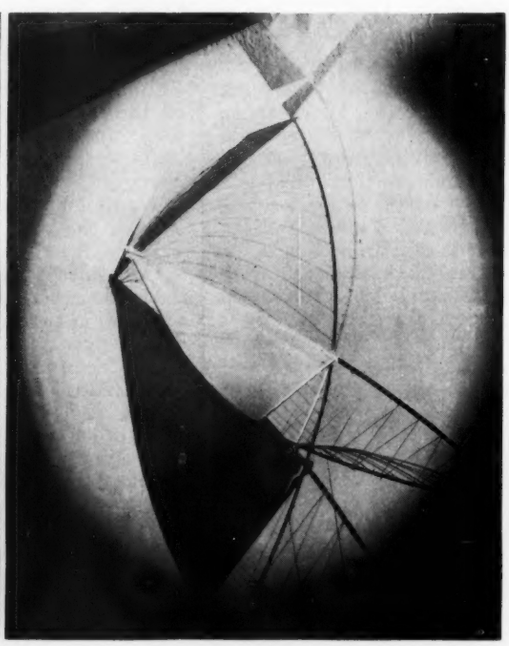
requesting allotments or ratings.

For privately-financed housing projects, the CMP-H-1 form is filed with the same field office of the FHA with which the original application (PD-105) was filed.

Significantly, there is a fixed limit to the period of time during which the P-55-b is operative. This authority to begin construction is operative only for a specified time, and, if no request for allotment of controlled materials or assignment of preference ratings is made on CMP-H-1 within this period, the authorization is withdrawn.

MOVEMENTS AND MATERIALS IN THREE-DIMENSIONAL FORMS

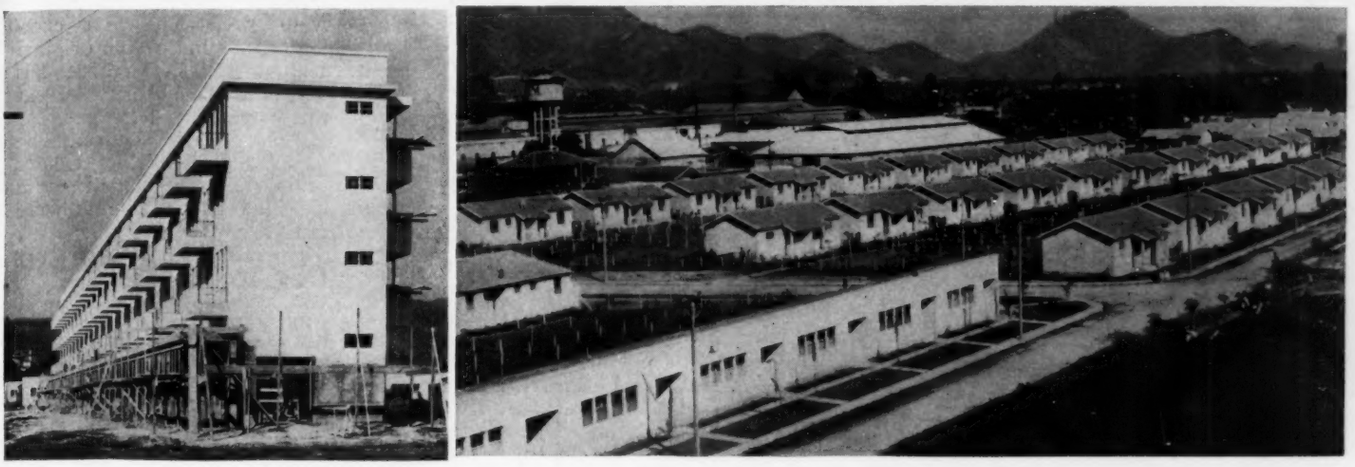




New York—A new kind of sculpture, designed for practical as well as esthetic purposes, is being developed in the Cooper Union Art School here. Students fashion models in unconventional materials such as wood strips, glue, and tissue paper, which can be used in commercial advertising displays, parade or pageant floats and settings, and re-styling of merchandise packaging. This sculptural treatment is explained by Dikran Dingilian, sculpture class instructor, as the "organization of space, light, line, and shape into an ordered relationship in three dimensions." The use of unconventional materials conforms with priority restrictions, also serves to inspire original designs suggested or dictated by the material.

Finished models include examples of suspended sculpture. Each swings on a light cord suspended from the ceiling, hence the term "suspended sculpture." Constructed of translucent materials, cheese cloth, tissue paper, flour-and-water mixtures, glue, plaster, and wood-strips, the models look like oddly shaped kites.

"The theme behind each construction may crystallize into a hard, flowing, angular, floral, or rock formation," says Mr. Dingilian. "The form will be largely determined by the material—whether it is soft, hard, spiral, laminated, or translucent, and whether any colors are present. The balanced relationships achieved are the same as those of any well-engineered structure."



Brazilian housing: at left, apartment-type unit; at right, air view of typical settlement.

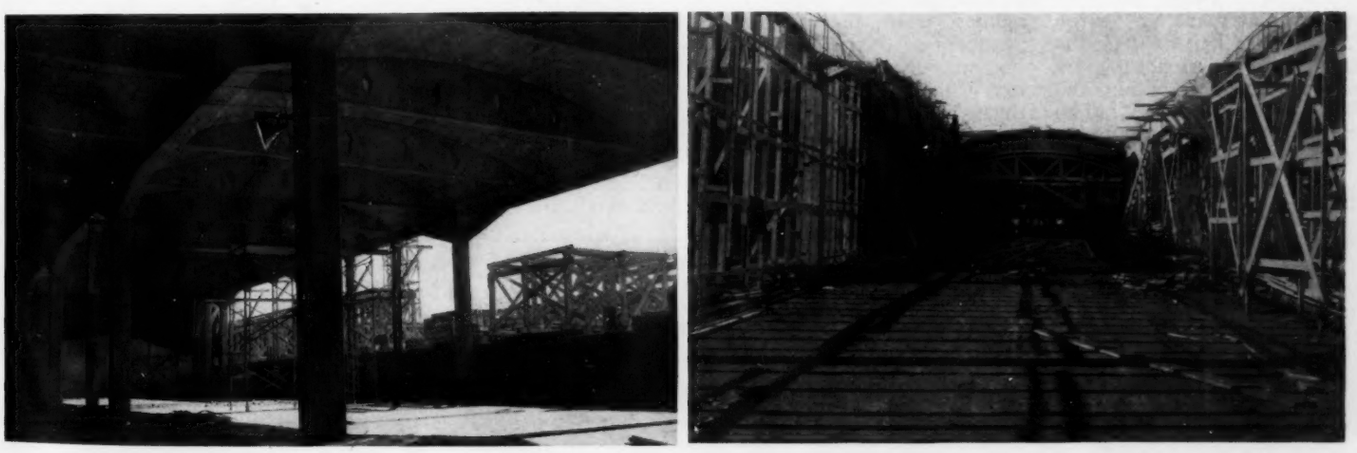
Brazil—To integrate the housing problem which has arisen in Brazil due to increased industrial activity, the Instituto de Aposentadoria e Pensoes dos Industriarios, one of Brazil's Social Security divisions, is now completing the construction of extensive housing and office building projects. These projects are being carried on simultaneously in Rio de Janeiro, São Paolo, Porto Alegre, Pernambuco, and Baia. The new construction includes electrical distribution equipment from Westinghouse.

Under Brazilian law, each project may consist of 50 to 500 residences. The site must be approved by governmental agency, and all residences must be within one kilometer radius of industrial establishments. The cost of each residential unit is between $250 and $1000, U. S. currency.

Workers may rent the homes for an annual rental not to exceed 7 percent of the total capital investment including land and construction. Homes may be purchased at approximately cost price with payments spread over a 15-year period. All residences are provided with sanitation and electricity, two conveniences heretofore enjoyed only by a small percentage of the working class.

(The interesting comparison with practices current in the U.S.A., which is afforded by this brief glimpse, may be further pursued if the reader will turn to page 62 where Bernard Rudofsky discusses it.)

ASSEMBLY LINE PRINCIPLES APPLIED TO WAR PLANT CO NSTRUCTION SAVE ESSENTIAL STEEL FOR MILITARY USE



Kansas City—Albert Kahn's firm designed the mammoth Pratt & Whitney plant now nearing completion here—a factory of such size that more than seventy football games could be played simultaneously within its walls. Here the theory of the architectural assembly line has been brought to a high degree of usage.

The mass construction line is a simple device—a series of mobile roof forms 80 feet in length and standing side by side a distance of 1000 feet. Each is on wheels fitted to rails. Every week the forms roll forward their length; that week the 1000 feet of reinforced concrete roofing and the roof-supporting pillars have been poured, set, and, except for installations of lighting and other inside fixtures, the building to that point is ready to receive its machine tools. The job is preceded by pouring the concrete slab that forms the floor.

Once the barrel-shaped form is in place, it is jacked to its position to receive the fabric of reinforcing steel and mesh fitted to the wooden arch to hold the concrete. When the jacks are lowered the form comes down on its supporting brace.

The photo at right shows a form that has been poured, lowered to a position where it can be moved, and later raised to receive another section of the roof concrete. Openings in the ribs are used for pipes and other mechanical installations. The interior view (photo at left) shows what is produced after the mobile forms have done their jobs and have been moved on to aid in setting the next section of the factory.

The concrete ribs across the arch are ties to withstand any horizontal thrust exerted by the arch section. Since each bay has a uniform design, the mobile production form can be used time after time. The height above the floor of the girders gives ample head room for manufacturing purposes and leaves space for the installation of the many service pipes, etc.

MAYOR KELLY LAUDS CHICAGO POSTWAR PLANS

Chicago Plan Commission officials and others at the ceremony. Left to right: George T. Horton, Robert Taylor, Jerrold Loebl, Leverett S. Lyon, Mayor Kelly, Kenneth Reid, L. C. Smith, H. E. Kincaid.

Chicago—Special pre-publication copies of the March issue of NEW PENCIL POINTS, presenting the Master Plan for Chicago, have been sent by Mayor Edward J. Kelly, of Chicago, to President Roosevelt, Vice President Wallace, NHA Administrator John B. Blandford, Jr., and Frederic A. Delano, Chairman, National Resources Planning Board. The copies were presented to Mayor Kelly at a special ceremony in the Chicago City Hall on Tuesday, March 30, in which the presentation was made by George T. Horton, Chairman, Chicago Plan Commission, and Jerrold Loebl, representing the Chicago Chapter, AIA. The magazine was represented by Kenneth Reid, Editor, and John Belcher, Advertising Manager.

The magazine, through its editor, congratulated Mayor Kelly on the leadership shown by the Chicago Plan Commission in advancing the Master Plan for the City to a point where it is evident that Chicago will be prepared to deal effectively with the anticipated postwar rehabilitation program. Chicago has set an example for other cities to emulate, if the coming of peace is not to catch them unprepared.

Among those present to take part in the presentation ceremonies were the following members of the Chicago Plan Commission: George T. Horton, Chairman; Ray McCarthy, Executive Committee; Frank Rathje, Executive Committee; Robert Dunham, Executive Committee; H. Evert Kincaid, Acting Executive Director; Leonard C. Smith, Executive Assistant; Homer Hoyt, Director of Research; Eugene S. Taylor, Office Manager; also, Robert Taylor, Acting Chairman, Chicago Housing Authority; Elizabeth Wood, Executive Secretary, Chicago Housing Authority; Alderman Arthur G. Lindell, Alderman George D. Kells, and Alderman James B. Bowler; Ferd Kramer, Metropolitan Housing Council; Edward J. Kelly, FHA State Director; Waldemar Weichbrodt, Director, War Housing Center; Leverett S. Lyon, Chief Executive Officer, Chicago Association of Commerce; Campbell McIsaac, Metropolitan Home Builders Association; Joseph Merrion, President, Metropolitan Home Builders Association; Paul Gerhardt, City Architect; Walter Kelly, City Planning Advisory Board; Oscar Rosenthal, Chicago Building Congress; Willard Day, NHA Regional Representative.

SAFETY CONVENTION HELD

New York—A three-day convention was held March 23-25 at the Hotel Pennsylvania here by the Greater New York Safety Council. Chairman of the session on safety in construction was W. J. Barney, president, W. J. Barney Corp., New York. D. Kenneth Sargent, chairman of the State Committee on Safety through Architectural Construction, was one of the speakers at the panel session on Safety in Design from the Architect's Point of View.

PATENT MODEL AUCTION

New York—The first catalogued auction of the original United States patent models will take place April 14-29 at the Architectural League, 115 E. 40th St., New York. The models are all working models of inventions which were the basis on which patents were issued up to the year 1880. The exhibit will be open daily from 10 to 5.

OPA CEILING ON PINE

Washington — Western pine and associated species of lumber produced in South Dakota, Wyoming, Colorado, Utah, Nevada, Arizona, and New Mexico were brought under dollars-and-cents ceilings recently by the OPA.

The action brought about by extending the geographical scope of Maximum Price Regulation No. 94, is contained in Amendment No. 1, effective April 5.

The amendment also made clear that all species commercially sold as Western, Ponderosa, or Mexican Pine are covered by the Regulation, including Lodgepole Pine, Mexican White Pine, Chihuahua Pine, Limber Pine, and Arizona Pine. All pine produced in Mexico and sold in this country is under the regulation.

Three other major changes relate to the method of computing the prices for green lumber, provisions for "fringe" mills, and private trucking allowances.

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METAL IN LIGHTING UNITS CUT BY WPB

Washington—Savings of 2500 to 3000 tons of ferrous metal are expected to result from the recently announced WPB Order L-212. The order slashed by 60 percent the amount of metal permitted in the manufacture of standard, utility, and industrial incandescent lighting fixtures, and by 80 percent the amount allowed in residential type fixtures.

The order also calls for certain simplifications and a reduction in the number of sizes and shapes permitted to be produced or ordered. Industrial lighting fixtures will be limited to three basic types—the shadeholder, the solid neck, and the heavy duty.

The order is intended to channel fixtures into essential war or civilian uses.

PENNSYLVANIA TO CONSIDER POSTWAR PLANNING

Harrisburg, Pa.—The Pennsylvania State legislature has been asked by Governor Martin to set up a postwar planning commission to outline construction projects which could be started after the war. The governor pointed out that the commission would consider a long-range program which would include the construction of new public works and buildings.

Baltimore — The Baltimore Committee on Postwar Adjustments has submitted to Mayor Jackson tentative plans for city development after the war which include the expenditure of $10 million on school construction.

N. Y. BUILDING CONGRESS HOLDS POSTWAR FORUM

New York—A series of four forum meetings on the general subject of postwar planning and urban rehabilitation has been scheduled by the New York Building Congress. Principal speaker at the first meeting, held March 10, was Guy Greer, co-author of the Hanson-Greer plan for land use. Mr. Greer discussed postwar planning in greater New York.

Subsequent meetings, tentatively scheduled for every second Wednesday beginning March 24, will be devoted to the subjects of "Real Estate Taxation Reforms," "Desirable Building Code Changes," and "Legislation Needed for Urban Rehabilitation."

CONSTRUCTION VOLUME CONTINUES DOWNWARD

Washington—The total volume of construction in the United States declined 14 percent from December to January as the downward trend continued for the fifth successive month, the WPB announced recently. About 80 percent of this volume was for war purposes, as compared with about 65 percent for January 1942. The January, 1943 volume of $783,500,000, represents a 46 percent drop from August, 1942, the peak month of last year, when construction reached a total of $1,468,000,000.

War housing and community facilities construction dropped 9 percent from December. The largest decrease occurred in the category of privately-financed housing. The drop here amounted to 20 percent. Government-financed factory expansion, including construction volume and machinery and equipment deliveries combined, showed a 10 percent decline in January. The volume of factory construction continued the downward trend with a 14 percent reduction.

WINDOW MANUFACTURE RESTRICTIONS REMOVED

Washington — Restrictions on the sale and delivery of completely fabricated metal windows in distributors' and manufacturers' inventories were removed recently with issuance of Limitation Order L-77 as amended. Heretofore, a rating of A-10 or higher was required for sale or delivery of these products. The amended order also changes the basis for manufacture of such windows.

In addition, the amended order takes cognizance of the fuel shortage by permitting the manufacture, without a rating, of metal storm windows from material partially fabricated prior to the issuance of the order. The existing regulation, that deliveries of material for manufacture into metal windows can only be made under the Production Requirements Plan, is eliminated.

The completed windows in inventory, which recently were estimated to be in excess of 150,000, are virtually all of the residential type. Industrial type windows, with few exceptions, are custom built to fill required specifications.

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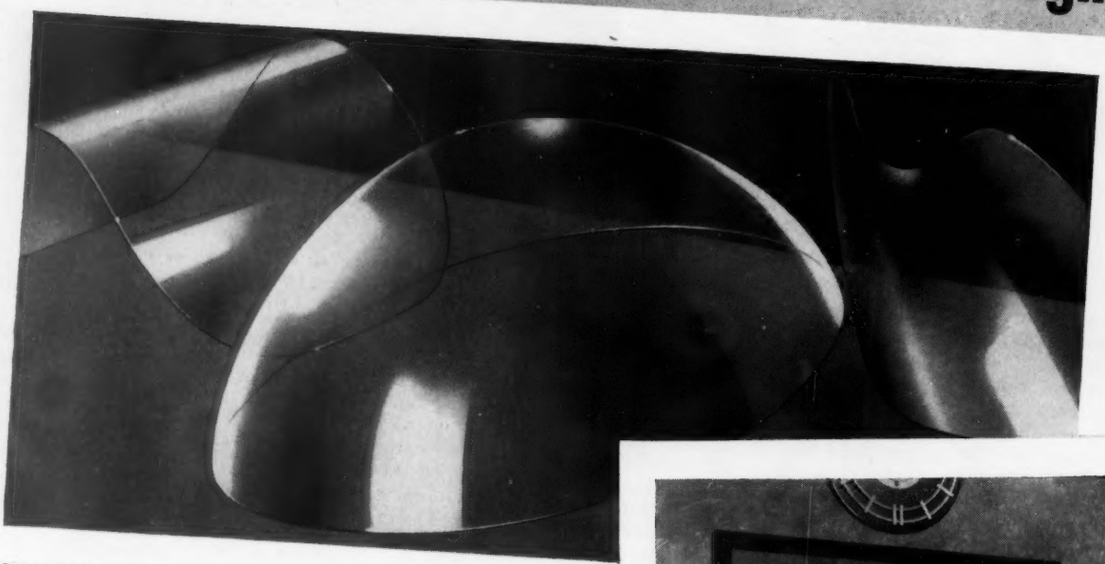
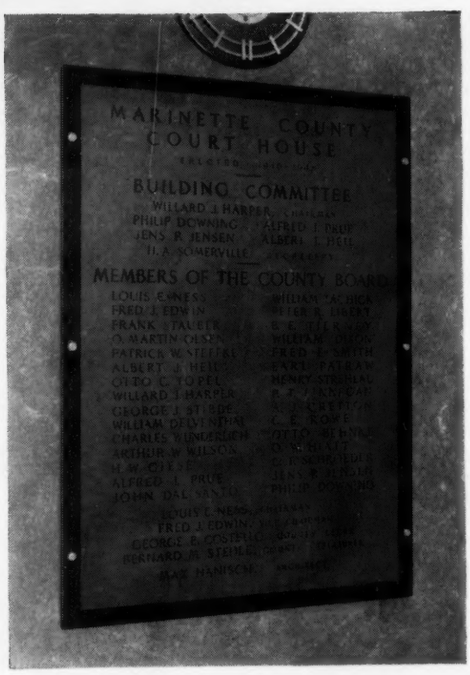
NEWS ABOUT GLASS from "Pittsburgh"



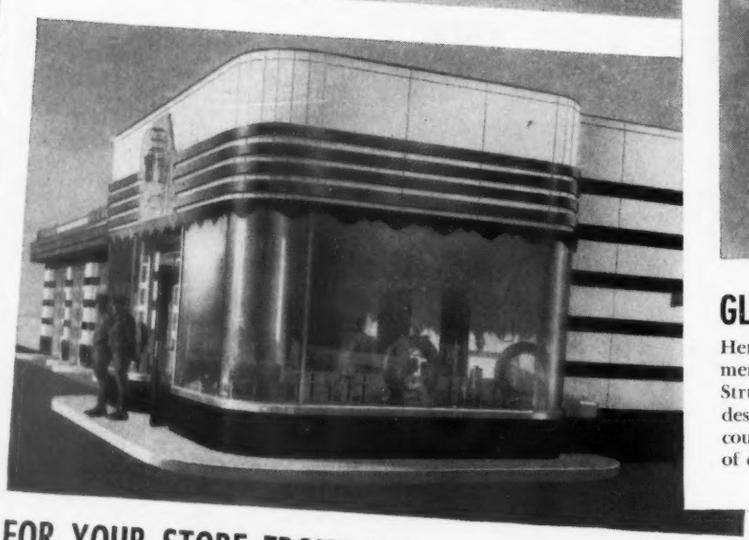
INTRIGUING NEW SHAPES.

Under the stress of war needs, "Pittsburgh" has discovered ways to produce new glass shapes never before thought possible. In peace-time, these new shapes will open up fascinating design possibilities to the architect.



GLASS PLAQUES REPLACE METAL.

Here is a new and interesting use of glass. Commemorative plaques like this of handsome Carrara Structural Glass with sand-blasted lettering and designs, are finding great favor throughout the country. They offer almost unlimited possibilities of color and design.



FOR YOUR STORE FRONT FILE.

This Pittco Front for a service station in Philadelphia indicates the design possibilities of Pittco Store Front Products in creating attractive, sales-building fronts. Save it for future reference when building restrictions are lifted. Architect: W. H. Cassebeer.

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For Progress:

In the midst of all our very natural and proper preoccupation with the subject of planning for post-war, we have no intention of neglecting the ever-present problem of the architect's effective participation in the War itself. As we pointed out many months ago, just after Pearl Harbor, there are two pertinent reasons why the architect must play a part in the War effort. 1, He must, though deprived of his normal opportunity to practice architecture, continue to earn a living and, 2, he must, to satisfy his conscience as an American citizen, do all within his power to contribute to his country's Victory.

We need not review here the efforts made by this magazine to awaken both government and business to the fact that the architect's skills could and should be readily adapted to a variety of useful War occupations. Our readers know that we put an able man in Washington for four months to battle vigorously on behalf of all architects, until the A.I.A. finally voted at its last Convention to add this particular activity to the duties of its own Washington representative. Our readers may not know, however, that we have continued since last summer to carry on the fight for recognition of the architect by means of correspondence with industrial concerns and by direct contact.

We have urged on a number of occasions that each local architectural group, each Chapter of the Institute, should organize itself to carry on a persistent and energetic campaign to educate the manufacturing executives and personnel offices in its vicinity to an understanding of the architect's potentialities as a valuable part of the national technical manpower reserve. We have pointed out that active salesmanship is a necessary factor in the present emergency. Waiting to be called upon won't do.

It is gratifying to present in another part of this issue a report of the activities of this type successfully carried on by the Southern California Chapter on behalf of its members. We know of other professional groups that have undertaken to do the same sort of job, but we do not happen to know of any that have been quite as successful. We urge that the example of the Los Angeles group should be studied by other architectural groups throughout the country and that this example be followed with persistence and vigor wherever possible. It can be done in any area where there is a substantial volume of war industry.

The whole experience of the pre-war and war months has pointed with increasing clearness to the need for the architectural profession, looking to the postwar future, to improve and consolidate its organization so that it can act promptly and decisively as a body when confronted by emergencies and also make its influence felt more steadily and positively during quieter times.

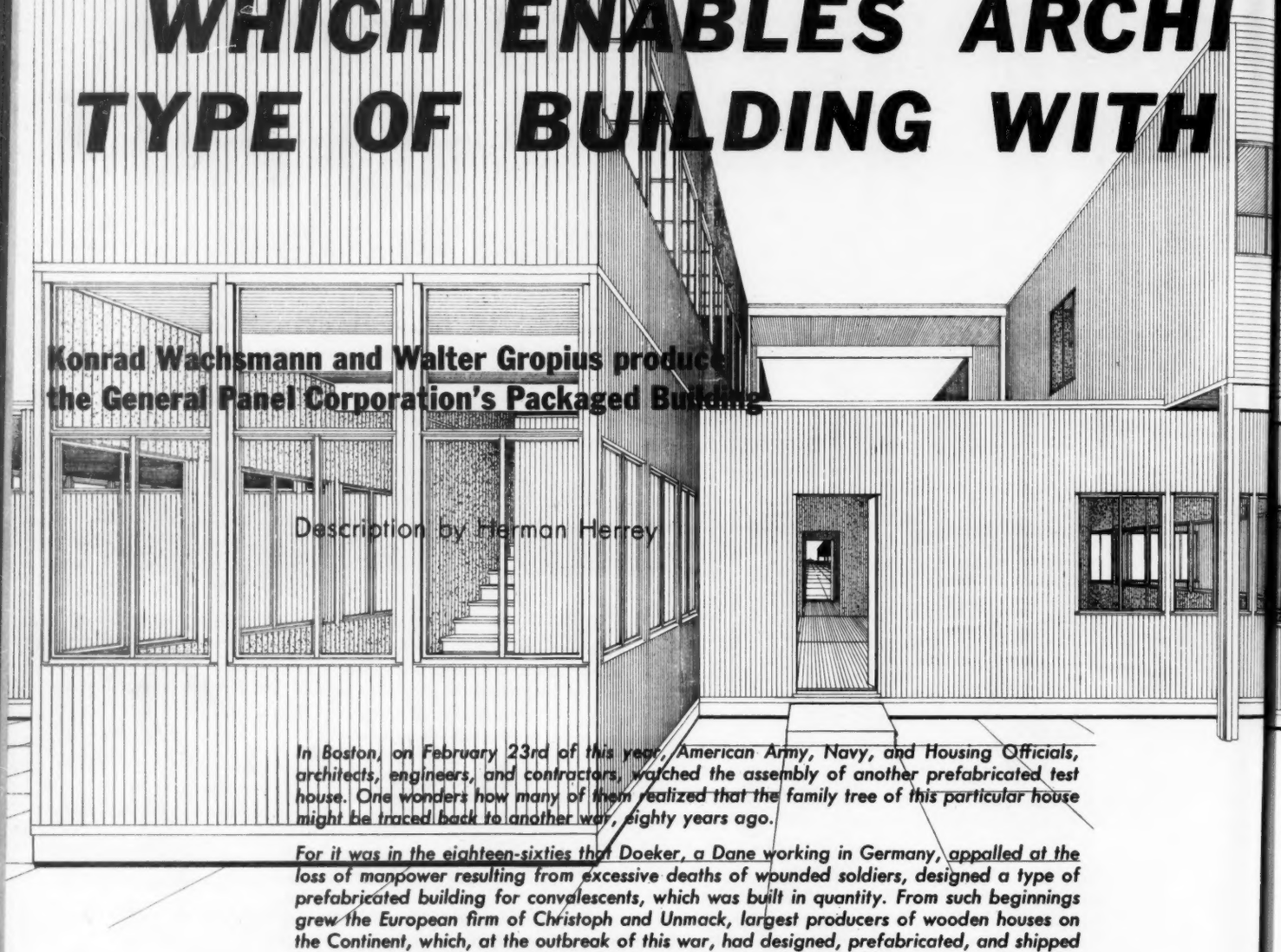
To bring about such a condition it would seem to us to be a necessity that the national architectural organization should have, in addition to its present officers, a well-paid, high-caliber Executive Secretary of the type employed by some of the eminently successful professional bodies. Such a man might be an architect, but not necessarily so. In any case, he should be free from connection with any architectural firm so that he could never be accused of having a personal axe to grind in his dealings with Government authorities or with private business.

Such a man, representing the *whole* architectural profession and supported by an adequate budget, could conceivably be worth much more to the profession than he would cost. By making use of all the means known to the modern science of Public Relations he could build up, over a period of years, a high degree of public understanding and acceptance of the architect—such an understanding and acceptance as has been lacking during recent times. This lack, we need hardly say, lies at the root of much of the difficulty encountered by architects during the war emergency period.

To propose that the architects find and appoint and support such a man calls for a positive forward step. We make the proposal, believing that it is high time that the architectural profession should take not one but many positive steps until it has re-established itself as a significant force in the building industry and in the country at large.

Kenneth Reid

AT LAST WE HAVE A WHICH ENABLES ARCHI TYPE OF BUILDING WITH



Konrad Wachsmann and Walter Gropius produce the General Panel Corporation's Packaged Building

Description by Herman Herrey

In Boston, on February 23rd of this year, American Army, Navy, and Housing Officials, architects, engineers, and contractors, watched the assembly of another prefabricated test house. One wonders how many of them realized that the family tree of this particular house might be traced back to another war, eighty years ago.

For it was in the eighteen-sixties that Doeker, a Dane working in Germany, appalled at the loss of manpower resulting from excessive deaths of wounded soldiers, designed a type of prefabricated building for convalescents, which was built in quantity. From such beginnings grew the European firm of Christoph and Unmack, largest producers of wooden houses on the Continent, which, at the outbreak of this war, had designed, prefabricated, and shipped to the four corners of the earth staggering numbers of prefabricated houses, camps, barracks, hospitals, and other types of buildings.

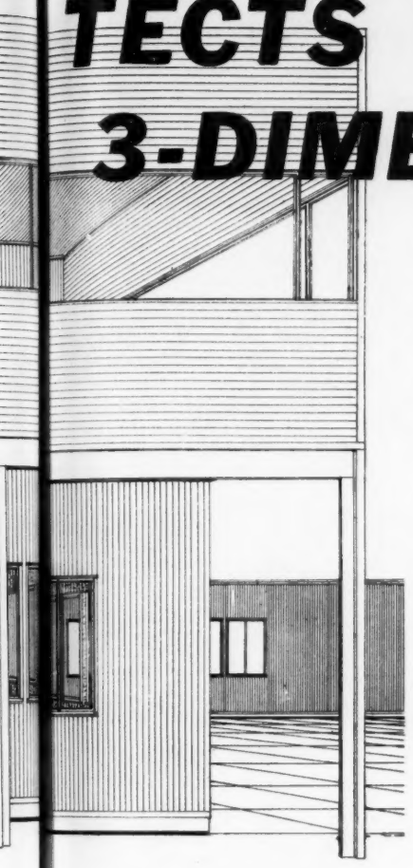
Konrad Wachsman, architect and an official of The General Panel Corporation of New York, founded to produce and market this system, was at one time head of Christoph and Unmack's design department. While there he designed, among other projects, a house for Albert Einstein. He has also written extensively on wood house construction.

Of Walter Gropius little need be said; his work abroad and in this country is too well known to require comment. But how many know, for instance, that in 1910 he urged industrialization of house construction; that in 1924 he suggested that "not entire houses, but ***construction elements*** *should be standardized and industrially produced." Both men are modest, the result of their efforts, the evolution of a flexible, modular, simple system which offers architects the advantages of prefabrication without the restrictions which most systems have heretofore imposed, is to them more important than their own identities.*

The present system is based upon materials now available — mostly wood. The test house was a faithfully-designed TDU-1; that is to say, it met in plan and cubic contents the requirements set up by the National Housing Administration for Temporary Dwelling Unit No. 1. Its assembly is so simple an operation that the only tool needed is a hammer; for disassembly, a pair of pliers. The entire construction is based upon the ingenious metal clips and wooden wedges shown here. No nails, screws, or other additional securing devices, are needed beyond those required for attaching wood finish, trim, etc. With this reduction, and even including the metal clips and standard hardware for doors, windows, etc., the weight of metal required for the test house is substantially less than is needed for conventional wood frame construction.

But the system has possibilities far beyond today's restricted demands. The drawing above shows one possibility. Others are illustrated in subsequent pages. Furthermore, the authors, when asked about its possibilities for use in Colonial cottages, agreed that it would be extremely simple to apply moldings to the panels, use small lights in the sash — or do to the house whatever a designer might wish.

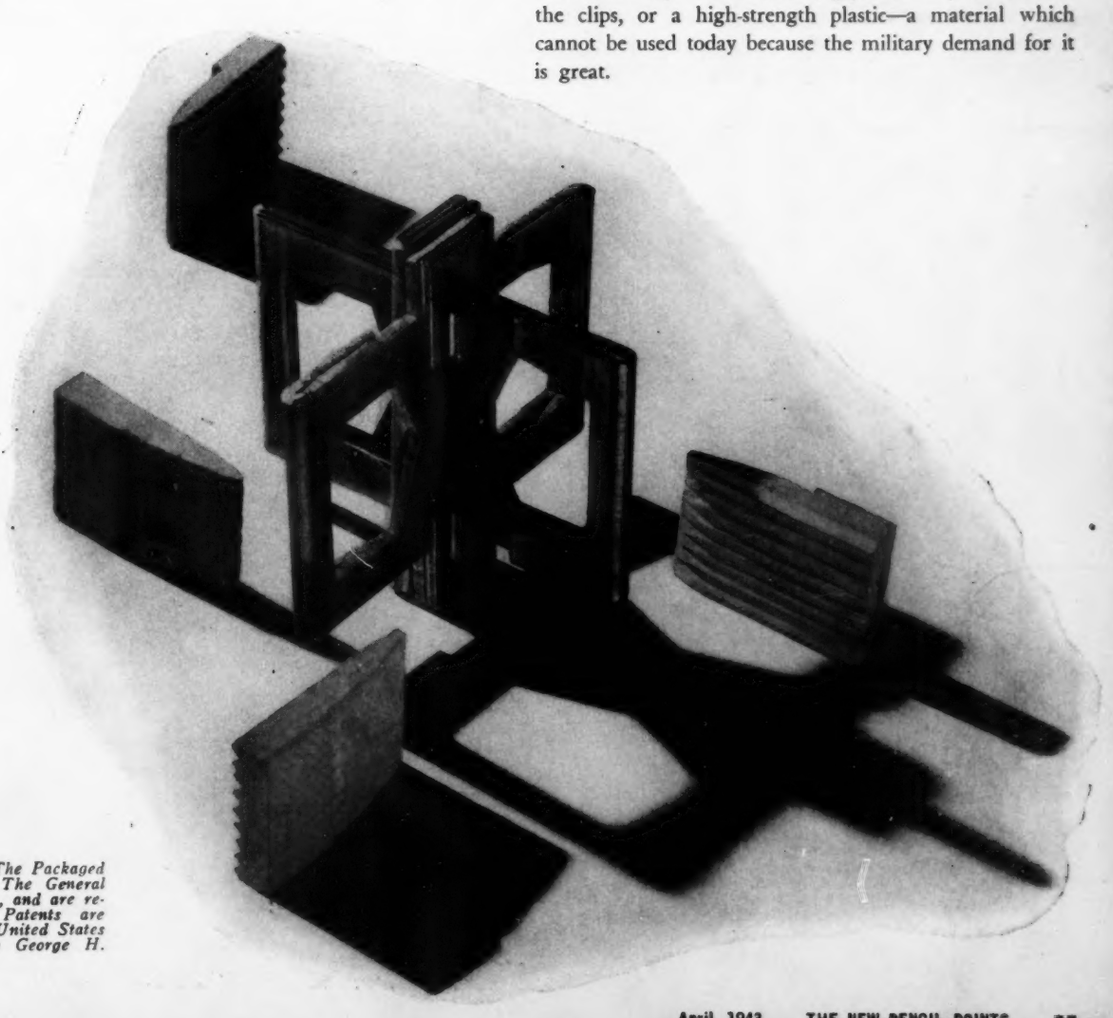
PREFABRICATION SYSTEM TECTS TO DESIGN ANY 3-DIMENSIONAL MODULES



The essence of the Packaged Buildings system is a standardized unit which is structurally identical whether used in walls, ceilings, or any other part. This is more completely explained on the following pages. The panels are joined with the metal-clip-and-wooden-wedge connector shown below—four, six, or eight being used per panel.

In the TDU-1 house, according to the General Panel Corporation, the weight of all the necessary connectors is 124 lbs. which, plus the (approximately) 42 lbs. of nails needed for securing surfacing material to the panel frames makes a total of from 160 to 170 lbs. of metal used structurally. This is satisfactorily less than the 200 lbs. per unit allowed by the War Production Board under present rulings, or the 300 lbs. used for similar purposes in normal times.

To those who question the use of metal, considering its scarcity, it should be stated that the metal clips used at present are fashioned from scrap metal left from the production of shell casings, and are sized to use this material most efficiently. In the future, plywood may be used for the clips, or a high-strength plastic—a material which cannot be used today because the military demand for it is great.



Drawings and photographs of The Packaged Building are Copyrighted by The General Panel Corp., New York, N. Y., and are reproduced with permission. Patents are pending on the system in the United States and abroad. Photography by George H. Davis and Benjamin Morse.

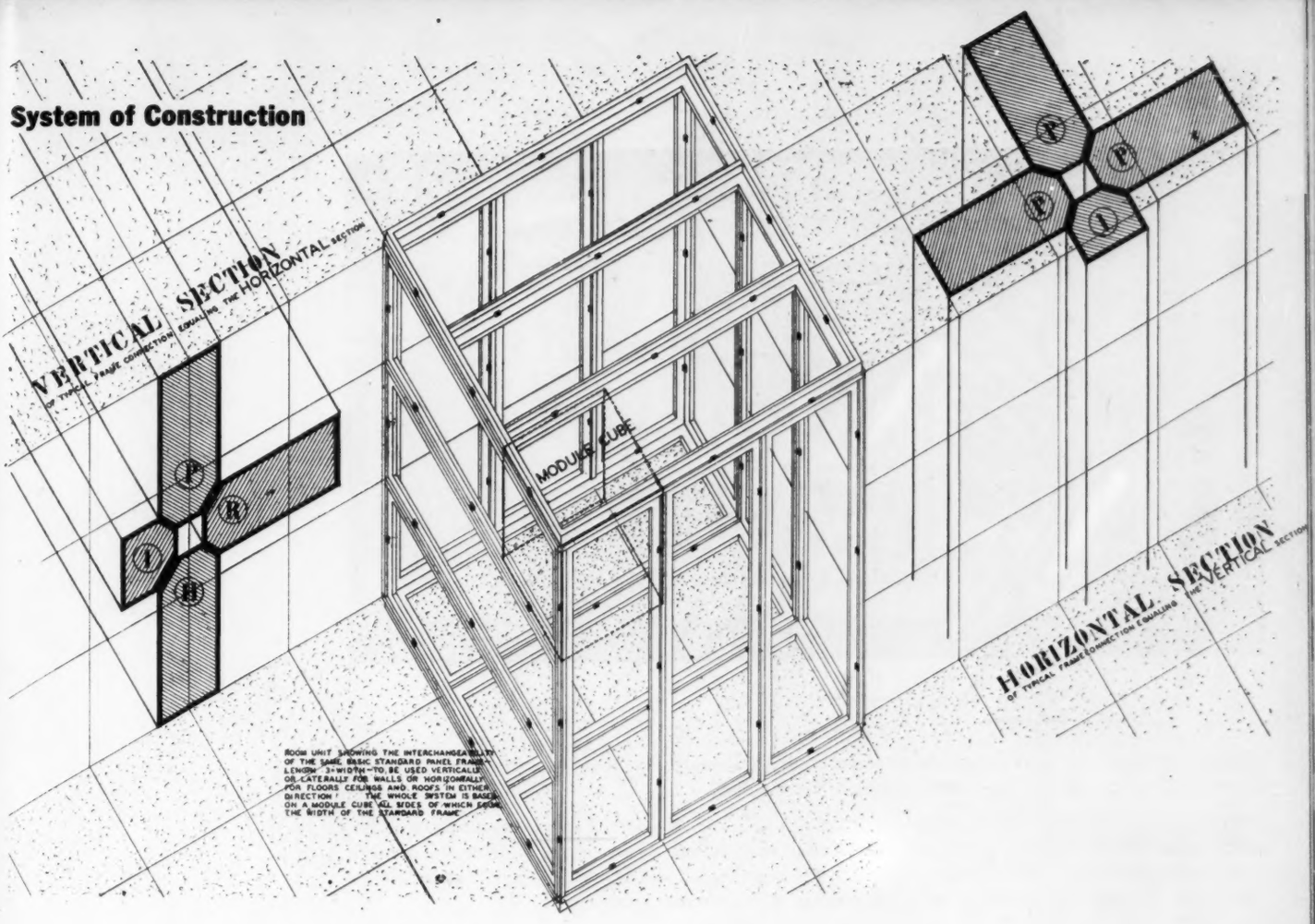
Panels are identical in all positions. In this photo, which shows only the framing, walls and floor appear from this viewpoint as they were assembled.

Turn the picture upside down, and the interchangeability of floor and ceiling becomes apparent.

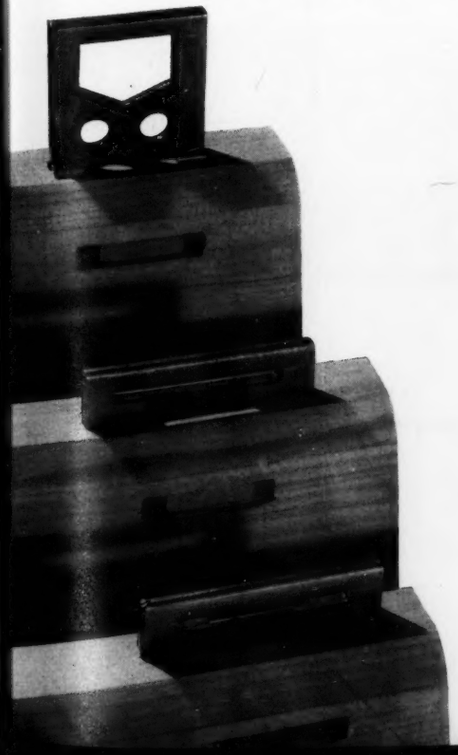
And from the side, it is understandable that the wall can become the ceiling, the floor the wall, etc. The Corporation's main activity is production of a few standard panels which can thus be used in any portion of the building. All have essentially the same skeleton, consisting of a frame of uniform thickness (1⅝ in.) and section. The frames, no matter how they are surfaced or penetrated for doors, windows, etc., have uniform beveled edges, slotted at regular distances, to permit the joining of all panels in an identical fashion, horizontally, vertically, or laterally. The technique of joining the panels, one of the system's most conspicuous peculiarities, is explained below.

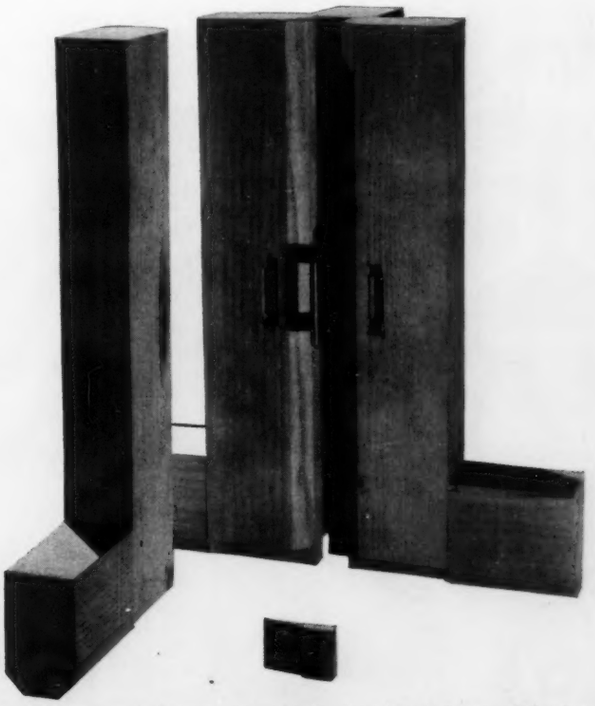
And from here, it might be a column, or an intersection of partitions, supporting a floor or ceiling. Since the edges are beveled at 45°, four members must meet around an axis wherever joints occur. This produces a standard joint section for every purpose. If only two wall panels replace the omitted panels. One filler strip is used where three panels meet. The chips are tightened in their slots before the outside wall, at a corner, filler strips replace the omitted panels. One filler strip is used where the factory. For assembly, one dip is slid through another, the last panels leave the factory. For assembly, one dip is slid through another—the only tool needed. Considerable strength and rigidity result with a hammer—the only tool needed. Considerable tests have been made, with satisfactory deflections at loads of 50 lbs. Reliable tests have been made, with satisfactory deflections at loads of 50 lbs. per sq. ft. distributed, 800 lbs. concentrated, on floor panels; and connectors were tested to destruction at 2500 lbs. It is probable, moreover, that the wedged joint helps to equalize shrinkage and expansion stresses.

The basic joint is designed three-dimensionally. From this point, it might be the juncture of framing of interior partitions with that of an upper floor.

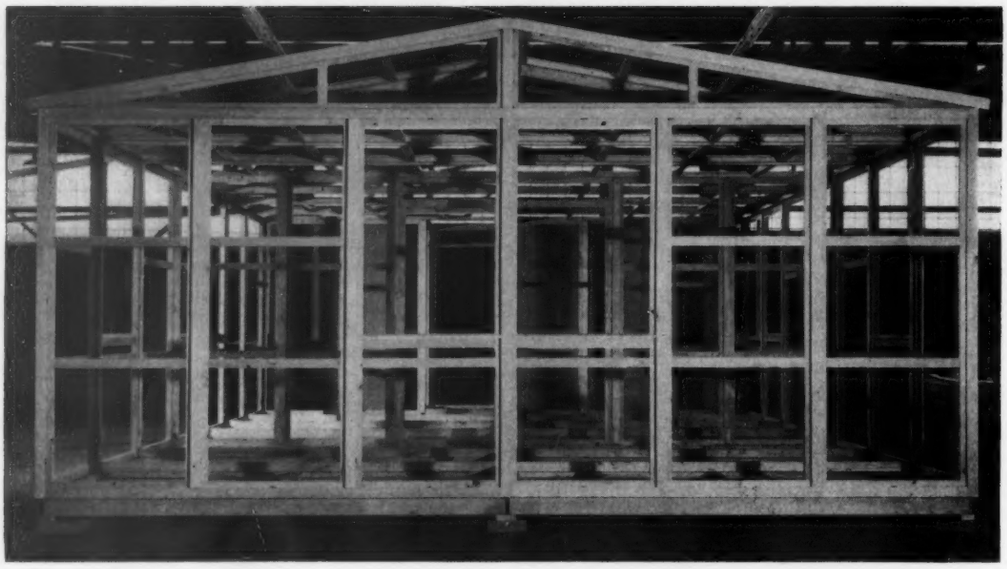

System of Construction
VERTICAL SECTION
OF TYPICAL FRAME CONNECTION EQUALING THE HORIZONTAL SECTION
MODULE CUBE
HORIZONTAL SECTION
OF TYPICAL FRAME CONNECTION EQUALING THE VERTICAL SECTION
ROOM UNIT SHOWING THE INTERCHANGEABILITY OF THE SAME BASIC STANDARD PANEL FRAME LENGTH 3 × WIDTH — TO BE USED VERTICALLY OR CATERALLY FOR WALLS OR HORIZONTALLY FOR FLOORS CEILINGS AND ROOFS IN EITHER DIRECTION. THE WHOLE SYSTEM IS BASED ON A MODULE CUBE ALL SIDES OF WHICH EQUAL THE WIDTH OF THE STANDARD FRAME

Panel members with factory-inserted clips wedged in place.



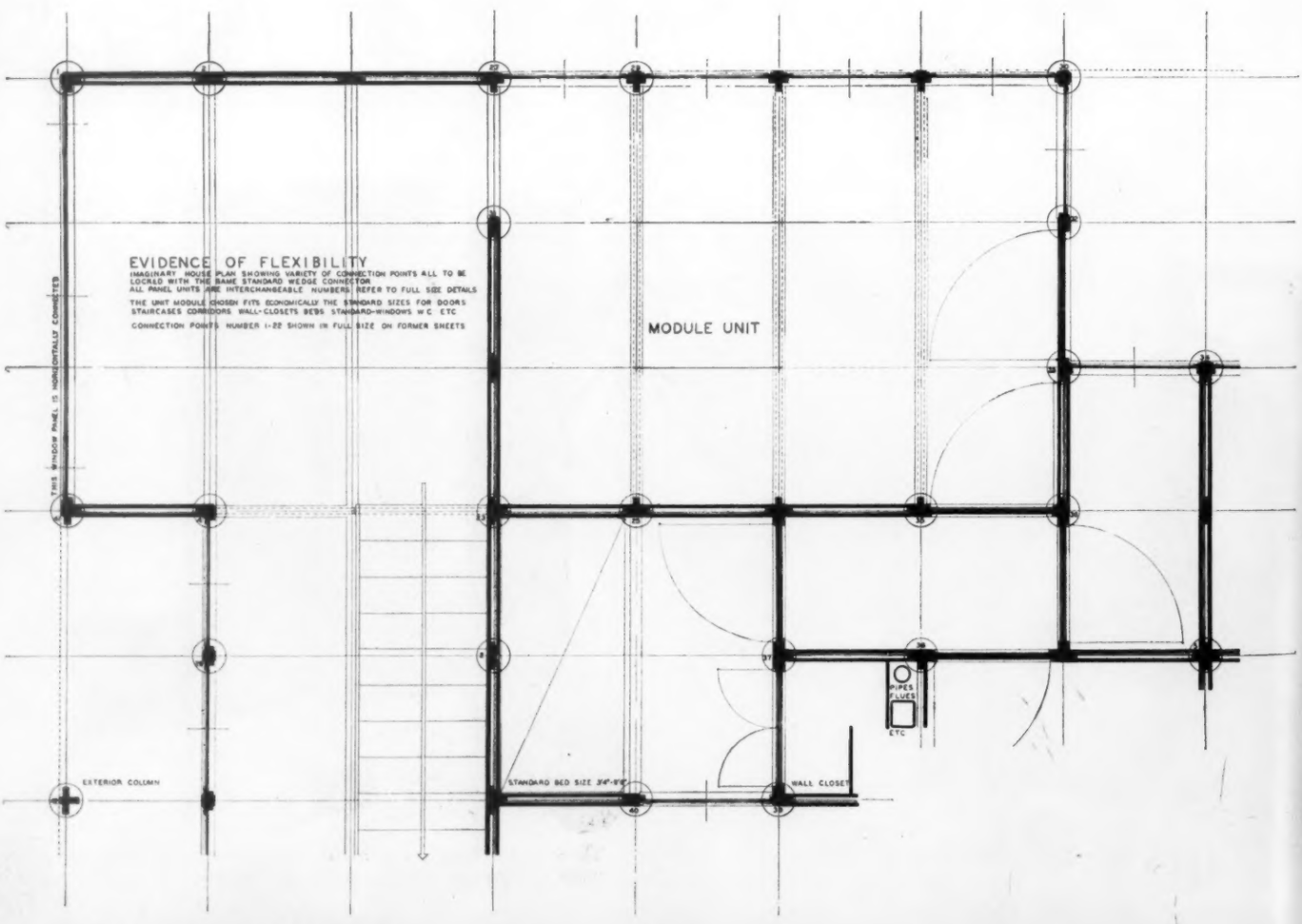


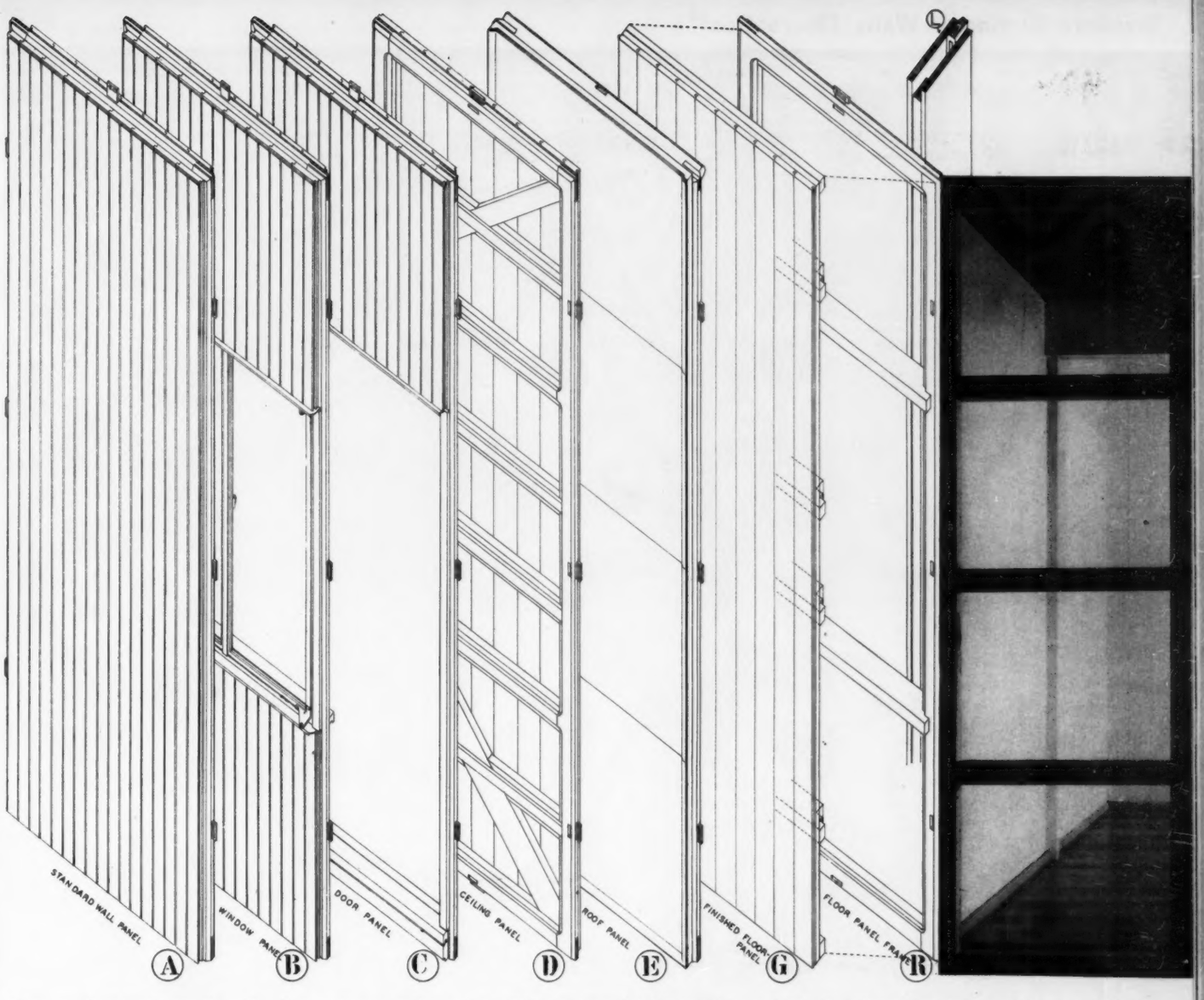
Three panel frames assembled, fourth ready to slide into place, last wedge to be driven in on the job.



Photograph shows the modular panels as frames only; it should be understood that panels are always shipped complete, with surfacing, doors, windows, etc. attached.

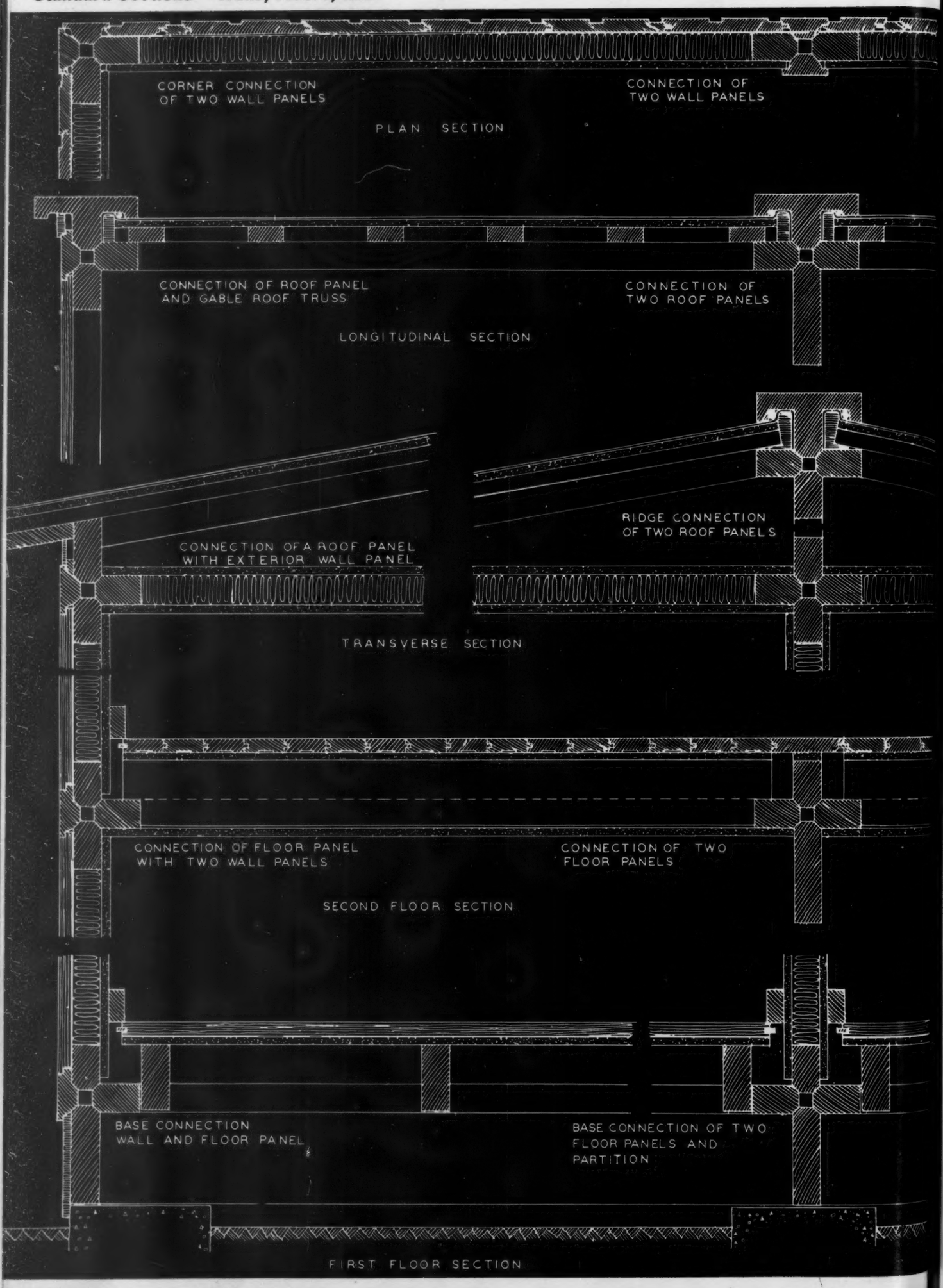
Drawing below illustrates use of the module cube in plan. The module is 3 ft. 4 in. in all three dimensions—a unit which produces spaces sized for human use. It was chosen as the minimum convenient construction width for doors, windows, corridors, and stairs; it is half the standard length of beds—considered to represent the controlling factor in planning bedrooms and living rooms.

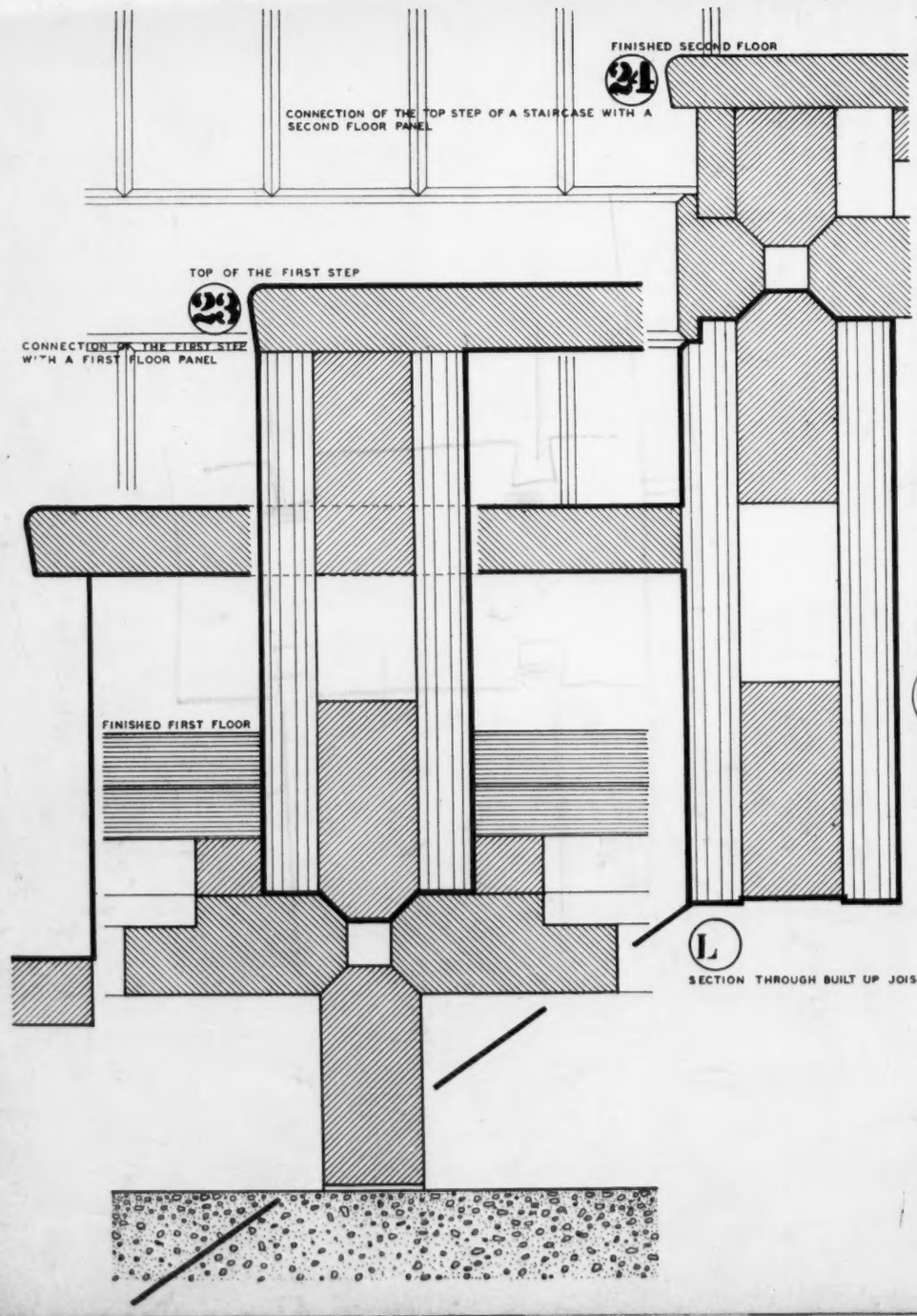

EVIDENCE OF FLEXIBILITY
IMAGINARY HOUSE PLAN SHOWING VARIETY OF CONNECTION POINTS ALL TO BE LOCKED WITH THE SAME STANDARD WEDGE CONNECTOR
ALL PANEL UNITS ARE INTERCHANGEABLE NUMBERS REFER TO FULL SIZE DETAILS
THE UNIT MODULE CHOSEN FITS ECONOMICALLY THE STANDARD SIZES FOR DOORS STAIRCASES CORRIDORS WALL-CLOSETS BEDS STANDARD-WINDOWS W C ETC
CONNECTION POINTS NUMBER 1-22 SHOWN IN FULL SIZE ON FORMER SHEETS
MODULE UNIT
THIS WINDOW PANEL IS HORIZONTALLY CONNECTED
EXTERIOR COLUMN
STANDARD BED SIZE 3'4"-6"
WALL CLOSET
PIPES FLUES ETC

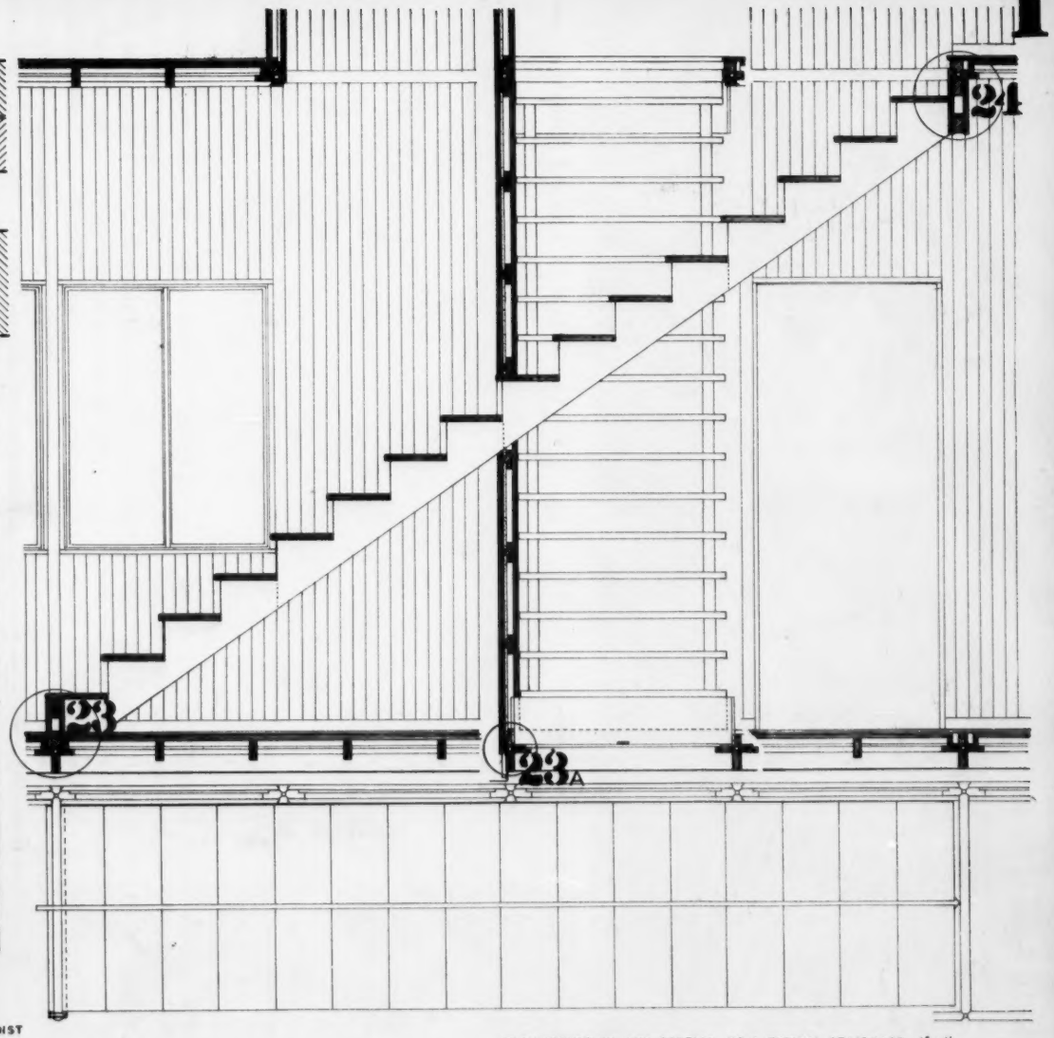


Above are four basic panels and a few variants. Filler strips, sills, trusses, and joists are also available. Panels and accessories all have a standard length of 10 ft.—three times module—thus providing expansion joints at regular intervals for units longer than 10 ft. in any dimension. Wall panels are at present surfaced with vertical siding, the joints of which are uniform with those at fillers strips. This makes concealment of the panel divisions a simple matter. All panels are flush, and the door and window units are designed without projections which might interfere with storage or shipping. Floor, ceiling, and roof panels are available in three lengths, to permit variations in plan—3 ft. 4 in., 6 ft. 8 in., 10 ft.

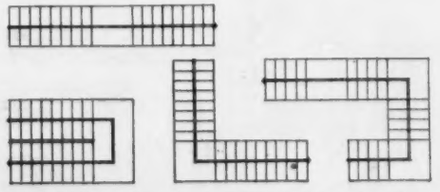
Standard Sections — Walls, Floors, Roof




FINISHED SECOND FLOOR
24
CONNECTION OF THE TOP STEP OF A STAIRCASE WITH A SECOND FLOOR PANEL
TOP OF THE FIRST STEP
23
CONNECTION OF THE FIRST STEP WITH A FIRST FLOOR PANEL
FINISHED FIRST FLOOR
L
SECTION THROUGH BUILT UP JOIST



PLAN ELEVATION AND SECTION OF A TYPICAL STAIRCASE 1/4" = 1'

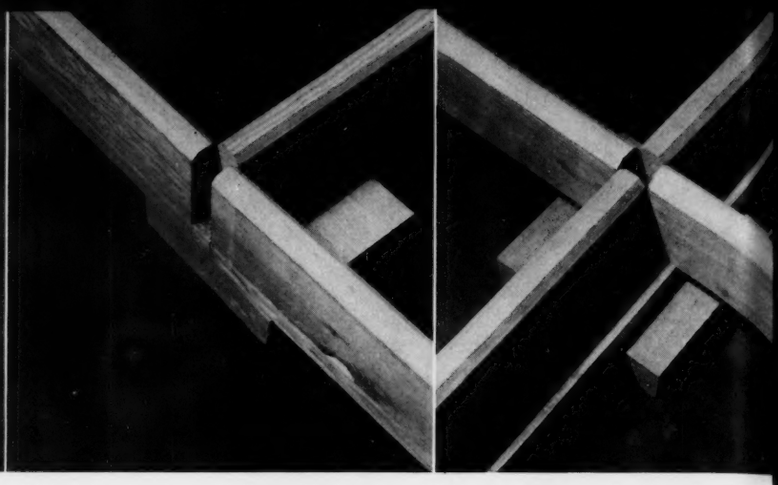


SOME STAIRCASE LAY OUTS—ANY MULTIPLE OF FOUR STEPS FITS THE SYSTEM

The Staircase

Standard stairs fit the module exactly, may be straight run, broken run, L-shaped, or U-shaped, as long as each unit of 4 treads, which has a run of 3 ft. 4 in. (the module), is kept intact. This and the drawing across-page also indicate the manner in which deep joists and other accessories are provided.

From this material House TDU-1 is assembled →



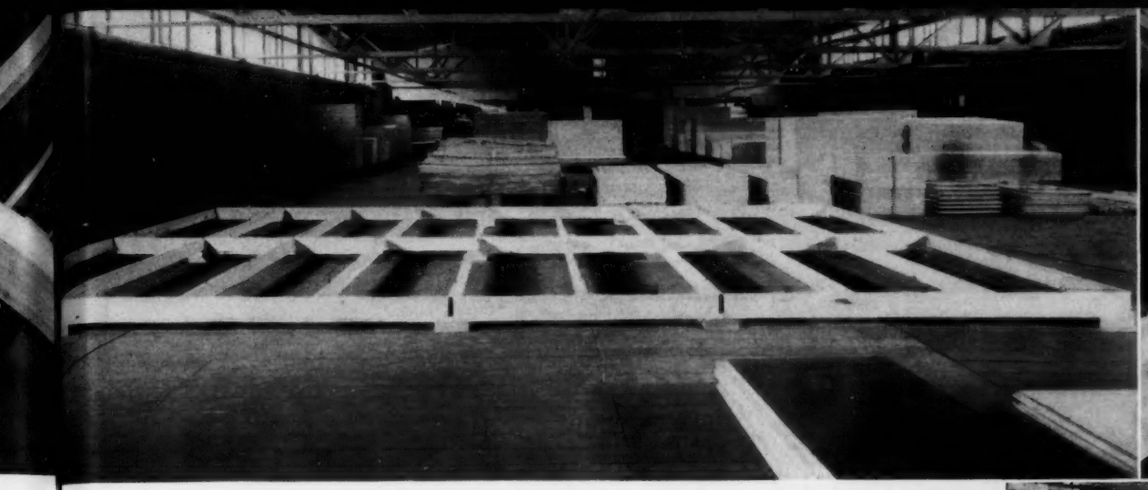
Sills placed at outside wall and partitions →

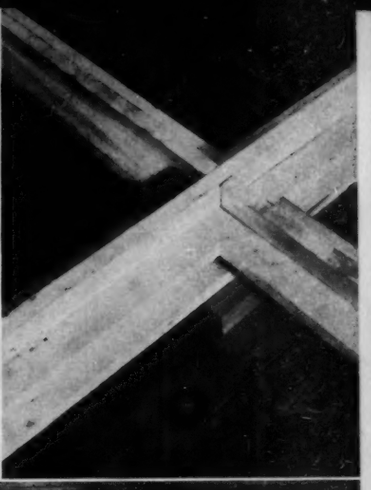
Assembly

In the assembly of buildings the supporting sills and subsills, with the first set of wedge connectors already inserted, are placed upon precast foundations or posts. Floor frames, empty at first, are hung between them and the first row of horizontal filler strips is added all around the house. Then upon the wedge connectors, which project above the sills, floor frames and filler strips, the wall, window and door panels of the first floor are set, and the wedges at floor level are driven in to form the first rigid connection. Then the interior wall panels are placed, and connected with exterior wall panels and vertical filler strips. Then the next set of wedges, this time in vertical joints, is driven in to complete the outer skin of the house. Above, joists and ceiling panels are set, and held in place by the wedge connectors which are fixed to the vertical walls, panels, and accessory parts. To complete this stage, either gable trusses and ridge supports—and then the roof panels with all accessories—are set up; or the wall panels of an upper floor are placed. The wedges are driven in as before. After installation of water and sewer connections, wiring, etc. is completed, the floor plates are dropped into the floor frames to complete the building. These are held until last in order to protect them from job hazards.
In disassembly, of course, this process is exactly reversed, beginning with the loosening of the last set of wedges. As all parts can be used again in the construction of the same or any other building, of the same or any other shape and plan, at another site if need be, the salvage

Completed TDU-1 house uses panels 8 ft. high instead of standard 10 ft. ←

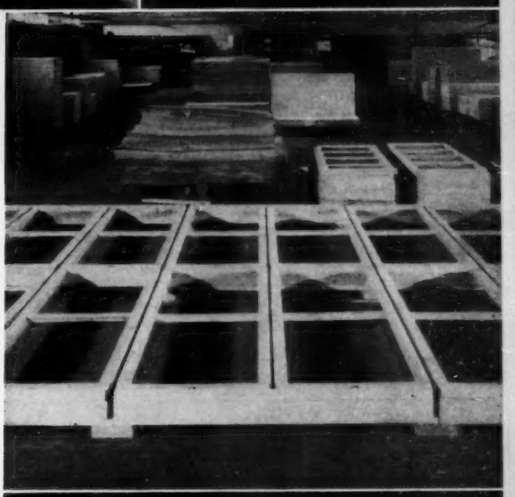
Last, finish floor dropped in place ←





Complete sill assembly (note connectors)

In corner, panel frames wedged to sills; right, floor panel frames set

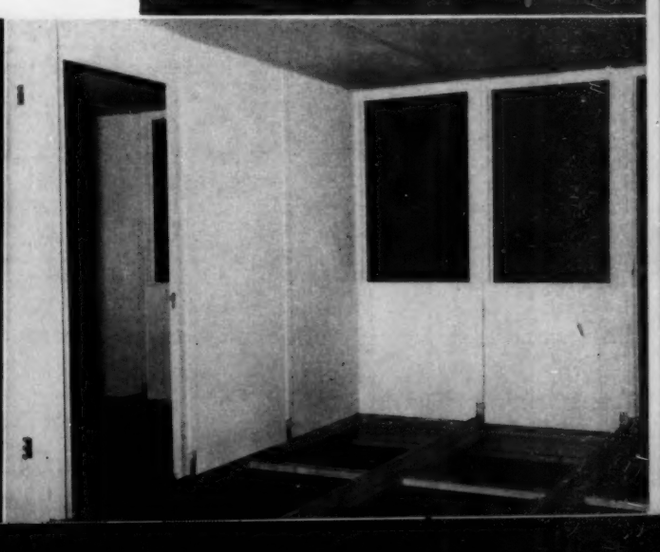


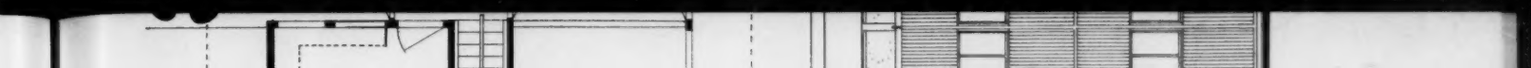
value is 100 percent.

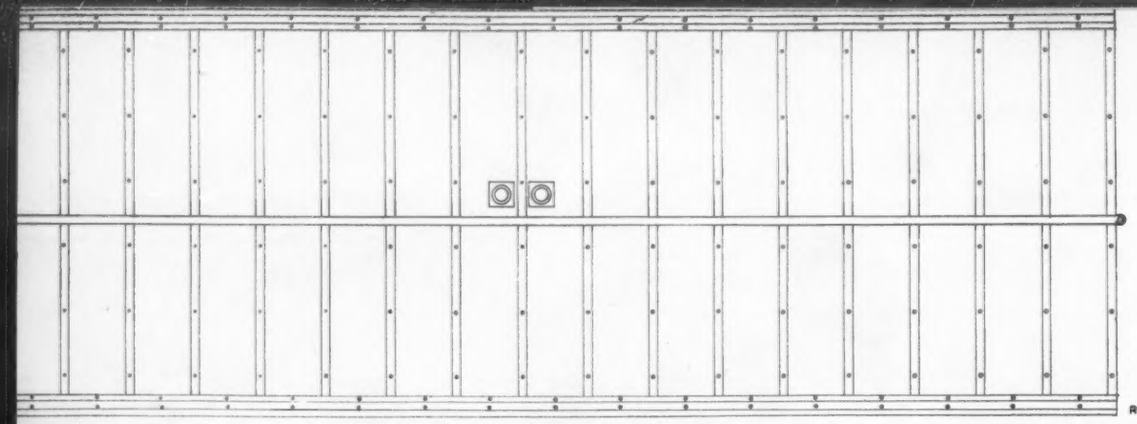
The extreme simplicity of the entire process is not the least of its virtues. No complicated milling machinery is needed for fabrication of the framing members, or for manufacturing the metal clips which are used at present—stamping and braking are the only operations involved here. The system reduces the need for some types of skilled labor at the site, but transfers that need to the factory, where, because weather cannot interfere with operations, employment is likely to be more continuous. This attribute is, of course, common to other prefabrication systems, but the Packaged Building system carries simplification of the erection process to a greater degree than most, if not all, others.

Assembly of gable panels being completed

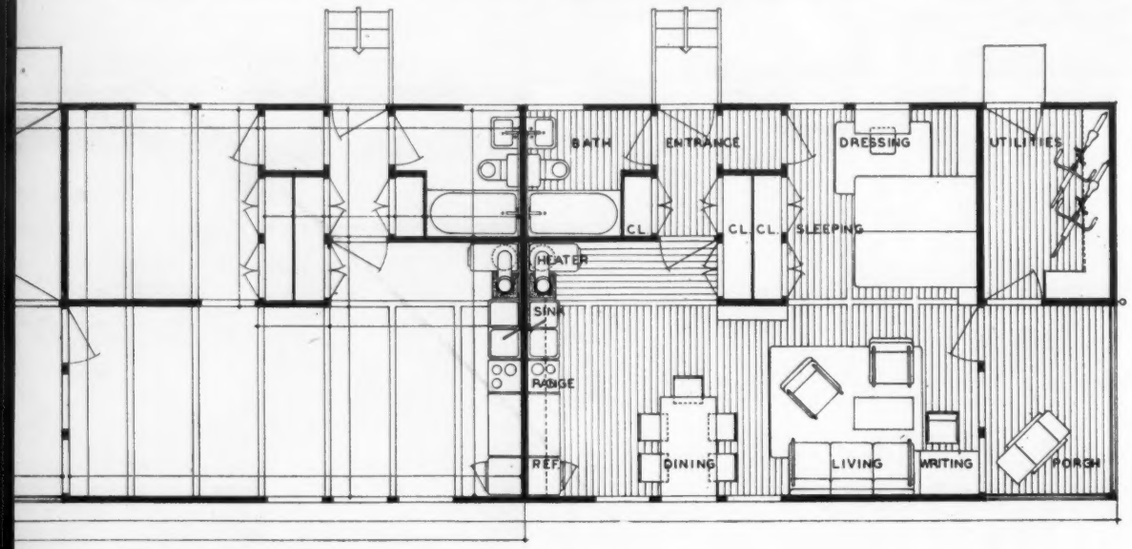
Right, wall panels set up on floor; below, interior partitions



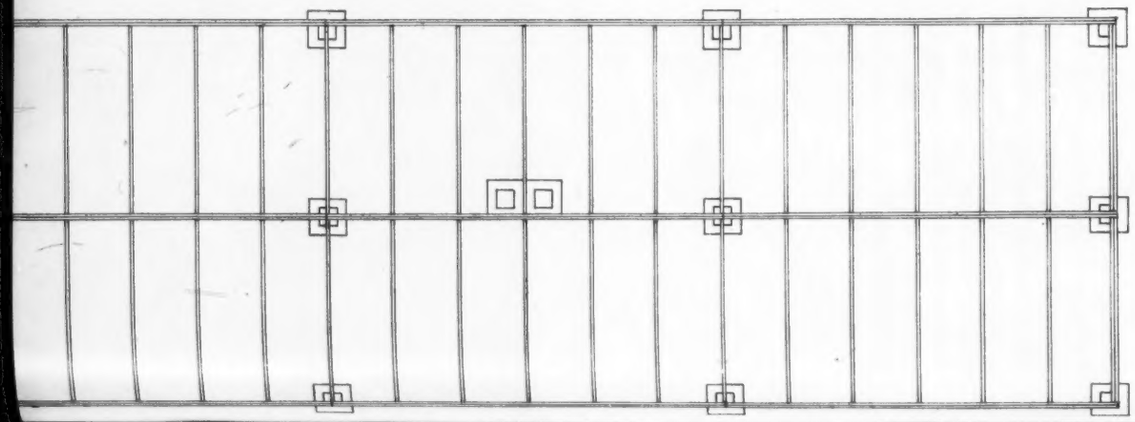




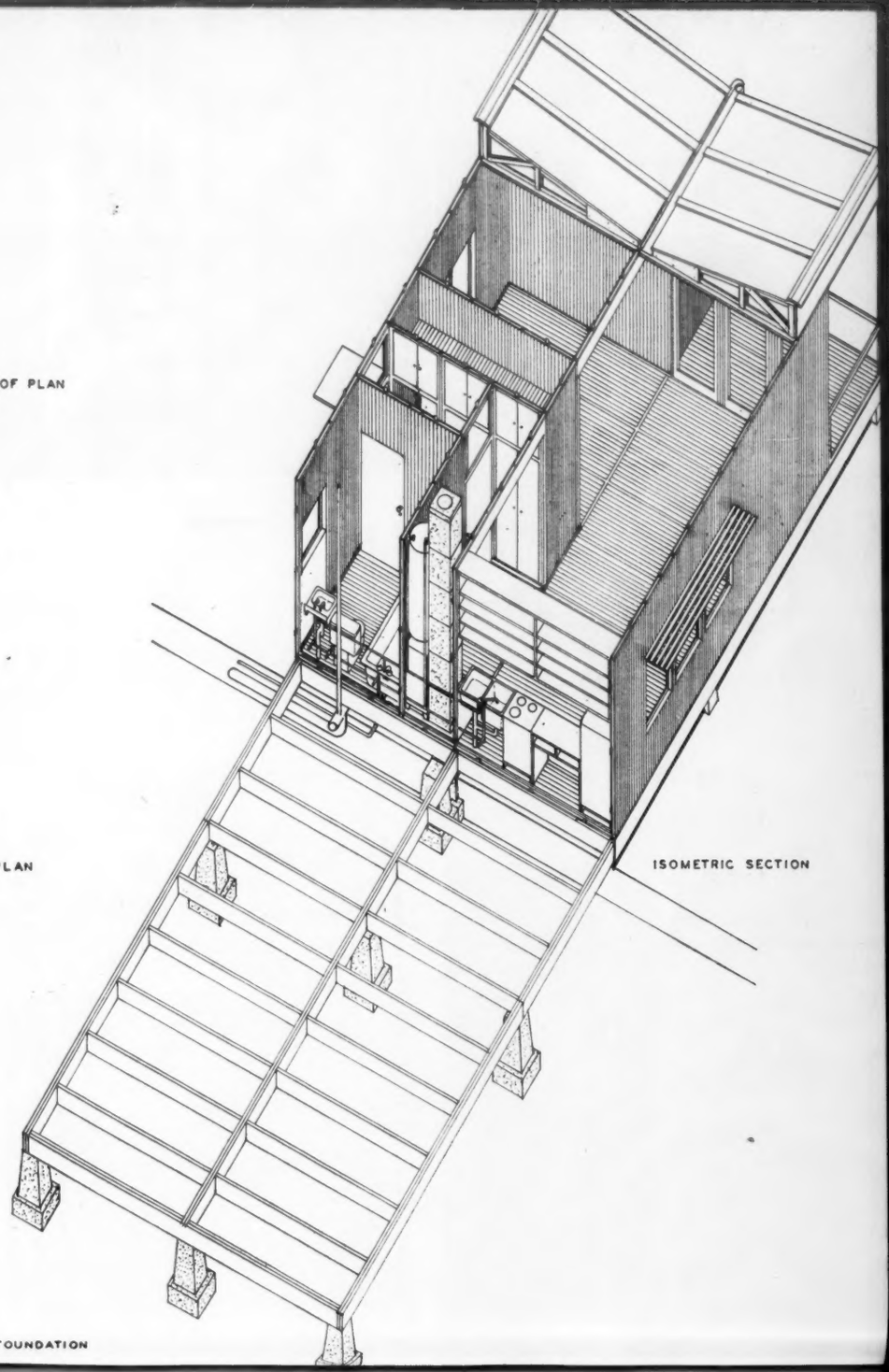
ROOF PLAN



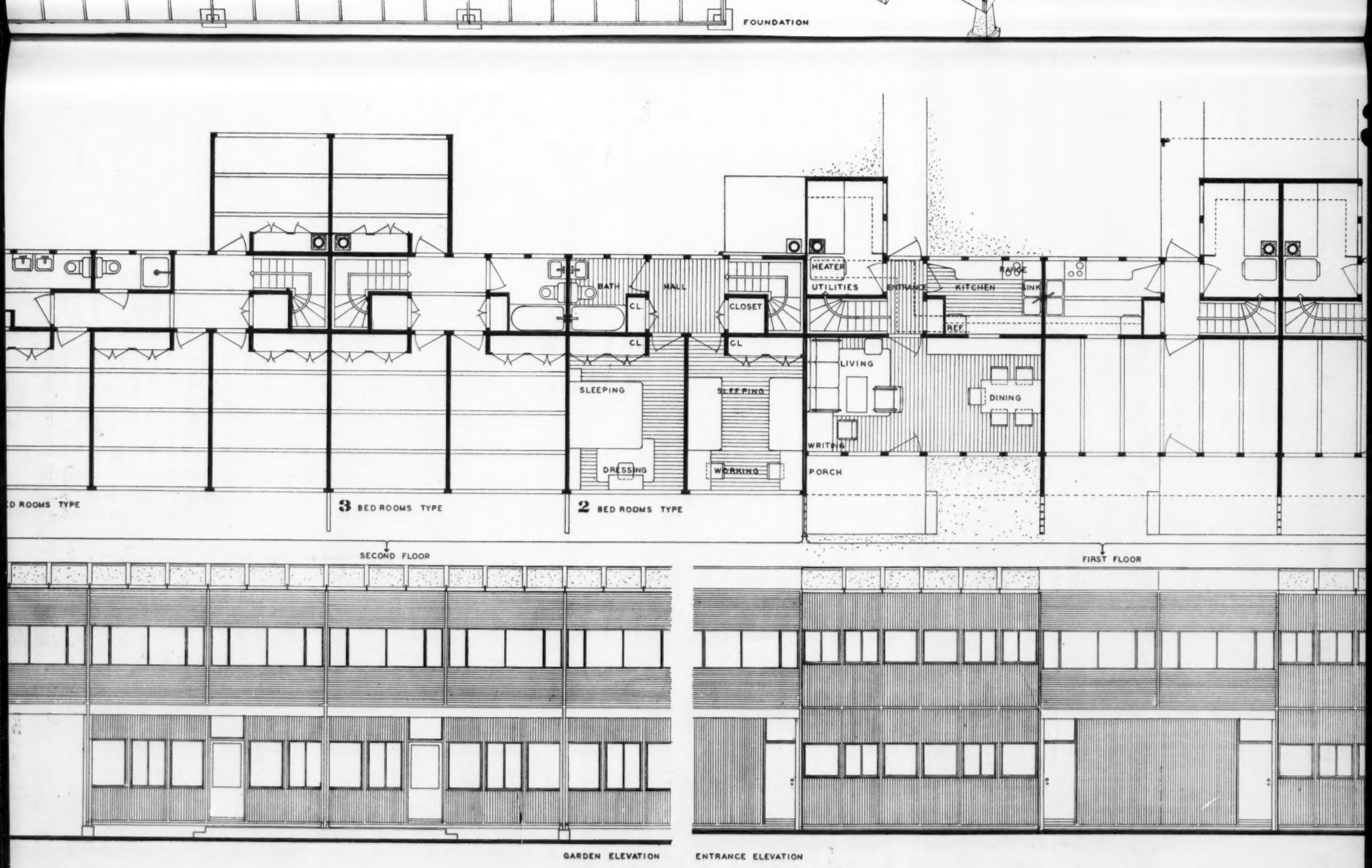
PLAN



FOUNDATION



ISOMETRIC SECTION



Other types of buildings

These two pages only begin to demonstrate the possibilities of the system. In the two-family, one-story house across-page, use of the module in plan to form halls, closets, and bath as well as living and sleeping rooms, is clearly visible. The isometric shows the standard plumbing wall, for which is provided a slightly modified panel. The two-story apartment row on this page also illustrates use of standard panels horizontally as well as vertically.

CITIES WHILE YOU WAIT: "Housing" in Washington and Oregon

by Walter Gordon

With the establishment in the Portland region of half a dozen shipyards and numerous other war industries, there developed a tremendous need, of course, for housing for the army of new workers attracted here. As in so many other cities in a similar plight, there was no real preparation for the immensity of the problems presented. And so, a tidal wave of "temporary" shelters has arisen and continues to rise, threatening to demolish the picture, cherished by local business groups, of Portland as a quiet, conservative town, safe for real estate values for a long time to come. Since none of the effective pressure groups wanted public housing, and the majority of architects thought it would be to their advantage to oppose it, no housing authority was created until war conditions forced the issue. Temporary housing was then forced upon the Portland region, and the results have been on the whole unhappy and unsuccessful, save as an extravagant educational experience.

The four Pacific Northwest states—Washington, Montana, Idaho, and Oregon—and Alaska have twelve percent of the nation's public housing projects. These four states and Alaska have, to date, 111 projects, with 66,379 dwelling units, about 17,500 of which have been completed. During the past eighteen months the Federal government has spent in the Portland region almost $250,000,000, or roughly the assessed valuation of the entire city of Portland in 1940; about $90,000,000 of this was for housing alone.

Formed December 11, 1941, the Housing Authority of Portland began with the problem of building 400 units. At the end of a year, the number of units approved and which were either completed, under construction, or for which plans were being prepared, numbered 17,500. Across the Columbia River from Portland, in Vancouver, Washington, where one of the incredible Kaiser shipyards is located, the local housing authority there started with the McLoughlin Heights project of 4000 units. At the moment the number of units totals 14,940, with 3000 more in the offing.

Vancouver's population of 18,788 in 1940 more than doubled in 1942, and when the present projects are occupied will double again. Portland's population increase from 310,000 to 426,000 is not the end. But lack of housing has now reached a point where it is acting as a serious brake on the recruiting of additional workers in almost every war plant.

The Gartrell Plan (named after C. M. Gartrell, the banker who is also chairman of the Portland Housing Authority) was the principal local solution offered to the desperately-urgent housing crisis. This consisted essentially of making use of existing utilities within the city system by erecting single-family, standardized dwellings on city-owned lots which were leased for five years by the Housing Authority. Real estate and financial interests were solidly behind the Gartrell Plan, chiefly because definite guarantees were made that this housing would really be temporary, and removed after five years, when the status quo could be resumed. But Washington was never enthusiastic about the plan and from the first it was several months before funds could be appropriated. When funds were finally available, it was then a case of lack of materials at a time when they were needed for the completion of housing units in dry summer weather. Exceptionally heavy rain during the winter months necessitated further delays in completing access roads and roads within projects, so that very often the units, even when completed, could not be occupied. Under the circumstances, the Gartrell Plan did not begin to meet the problem.*

In addition to the Gartrell Plan, the major accomplishment of the Portland Authority is Columbia Villa, located in the St. John's region near Kaiser's Oregon Shipbuilding Company. This 400-unit group, the larger of the two permanent housing projects in Portland, consisted of two- and four-family apartments, each including kitchen, dining alcove, bath, and one, two, three, or four bedrooms. Construction of Columbia Villa began May 5 and was completed practically on schedule in November.

From several points of view, the Columbia Villa permanent housing is the most successful in the region. Located on a rolling site, the apartment blocks are pleasantly organized in groups of three around widely curving roads leading up to a community building. An impression of variety and spaciousness is achieved, and there is good use of color in the shingle siding. Even on the simple basis of speed alone, construction and occupancy of these permanent units were actually faster than was the case with at least two projects of temporary houses in the same neighborhood which began at about the same time. For example, out of 1000 temporary units projected for St. John's Woods on May 28, only 73 were completed and 70 occupied by January 5, 1943. For the Parkside Homes temporary project nearby, only 186 have been completed and 183 occupied by January 5th, of the 260 units planned.

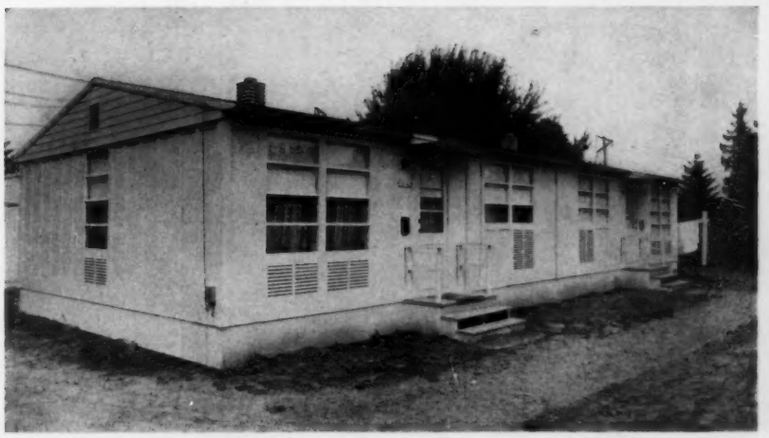
This comparison between the speed of erection of temporary and permanent housing certainly cannot be put on any scientific basis until all the data can be compiled. It would indeed be gratifying to conclude that permanent housing can compete with temporary when speed is the principal requirement; such was actually the case with some of the projects in the St. John's area. On the other hand, out of 1000 permanent housing units in Vancouver, begun August 5, only a few have been completed, while 2000 out of 4000 temporary units

(Continued on page 51)

**It was not until May 7 that construction started on the first 13 Gartrell units. By August 9, 167 were occupied. But by January 5, 1943, only 402 units were completed and 396 occupied—out of 725 which had been projected on August 9.*

Leonard Delano photo

Across-page is part of the dreary flat, with house-platforms waiting for one of the huge developments which was shortly to spring up near Vancouver. Out of 1000 permanent houses in this area only a few were completed at the time of writing, whereas half the 4000 temporary units were occupied—perhaps the best record in the Washington-Oregon region for "temporaries." (Photo courtesy Vancouver Housing Authority.) At right is a typical duplex "Gartrell" home, on a leased lot in Portland. This scheme, pushed by real estate and financial interests, was never very popular, although it was guaranteed to produce really temporary housing.

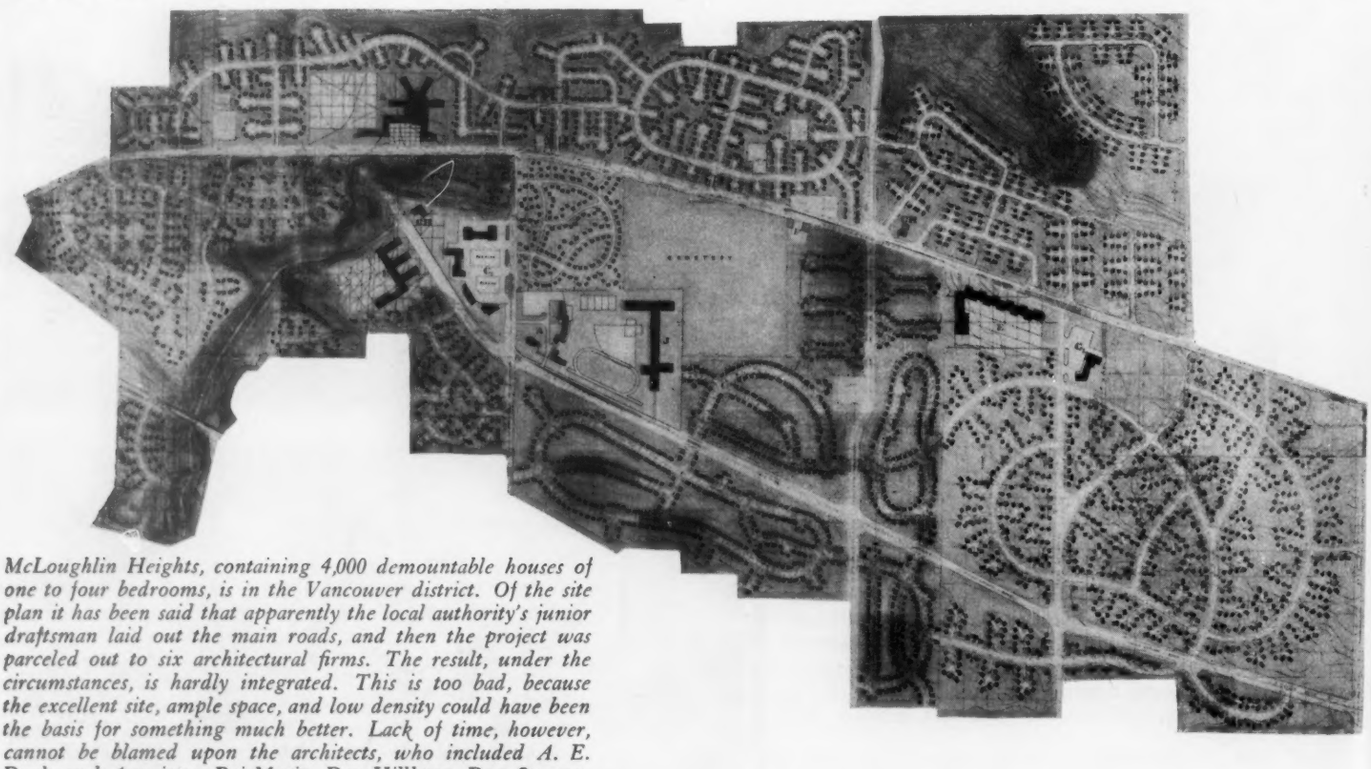


These three views of Columbia Villa, in Portland (Stanton and Johnston, Architects) show, top to bottom, a general view, typical court, and typical living room. Fine paved roads and gutters, spacious courts, and a well-studied relationship between houses and open space characterize this project. Yet, note the wooden fences around the pipe chimneys. This is permanent housing; completed last November practically on schedule, construction was actually faster than that of two adjoining temporary projects. But this comparison between "standard" and "prefab" or "demountable" construction cannot be made fairly until a precise evaluation is made of the factors of familiarity, availability of materials, weather, etc.

Leonard Delano photo

Unfinished street in the St. John's Woods project (Lawrence and Holford, Jones and Marsh, Roald and Schneider, Associated Architects), where 1,000 temporary units were projected last May and only 73 were completed and 70 occupied by January fifth of this year. In comparison with Columbia Villa, St. John's suffers from a cluttered oppressiveness—probably due to the high density which was forced upon the designers. Perhaps, also, the way in which available materials were used played a large part in producing this effect.

Columbia Commercial Studio photo



McLoughlin Heights, containing 4,000 demountable houses of one to four bedrooms, is in the Vancouver district. Of the site plan it has been said that apparently the local authority's junior draftsman laid out the main roads, and then the project was parceled out to six architectural firms. The result, under the circumstances, is hardly integrated. This is too bad, because the excellent site, ample space, and low density could have been the basis for something much better. Lack of time, however, cannot be blamed upon the architects, who included A. E. Doyle and Associates, Roi Morin, Day Hillburn, Don Stewart.

Legend: S, Senior H.S.; J, Junior H.S.; E, Elementary School; CH, Churches; A, Administration; F, Fire Station; C, Commercial Centers

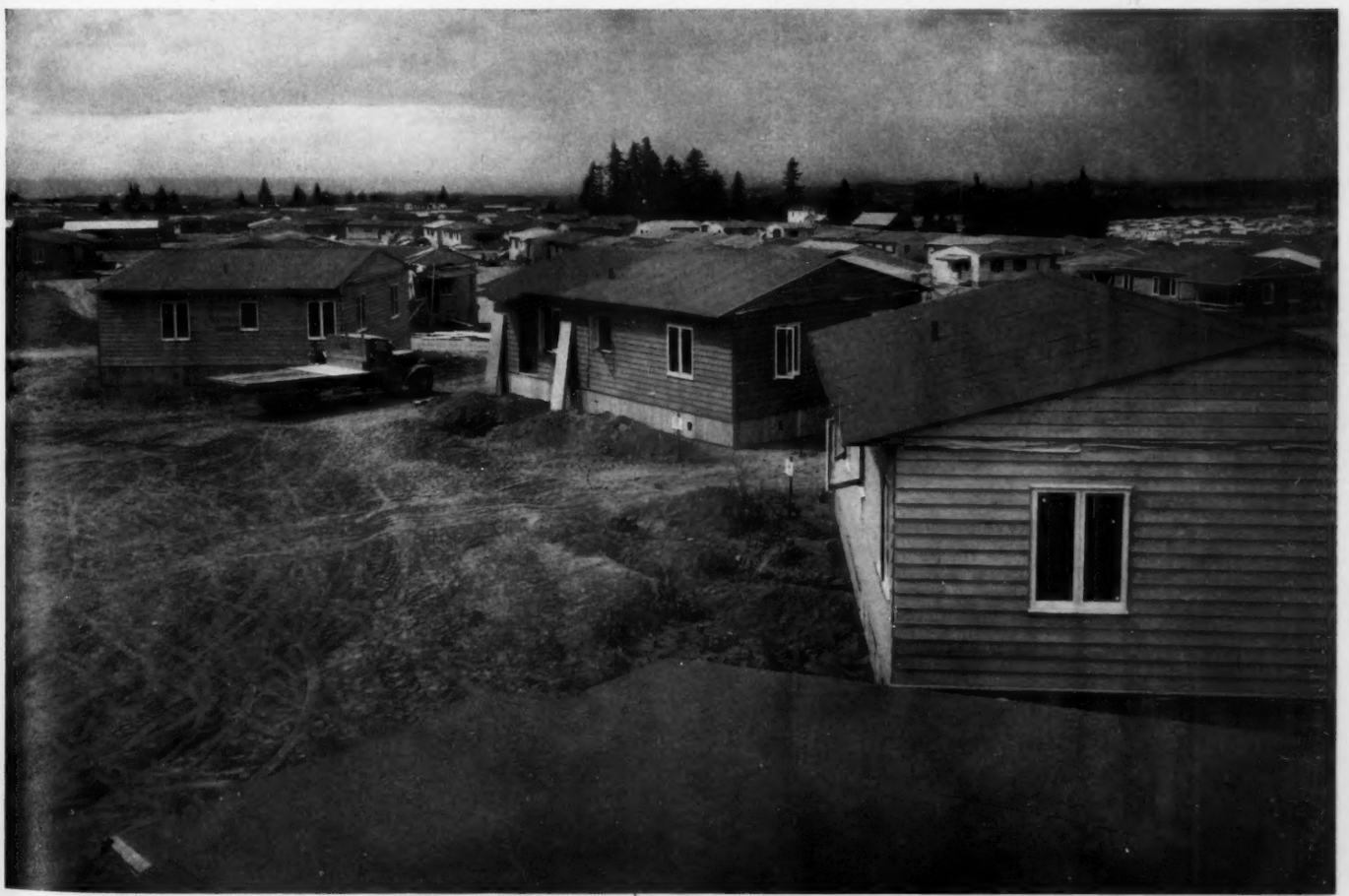
in the same region are occupied. Complicated factors of delay have entered into each project which will have to be considered individually when all the facts are available.

Construction of Vancouver's 4000 "demountable" houses on McLoughlin Heights, offering from one to four bedrooms, began on April 27. By Jannuary 5, 2000 houses were still unoccupied and completion of the others had been greatly delayed because of inability to obtain small items of plumbing and wiring. A complete group of community buildings has been planned for this project, but of all these the commercial center was the only building to be actually started relatively early (July 10). By January 5, one minor shop was in operation in the commercial center; the remainder was held up for lighting and other fixtures.

For the site planning of the McLoughlin Heights project, the area was divided into six sectors, and an architectural firm chosen for each of the sectors. Each group of architects worked independently, apparently, for if there was any cooperation, it is not evidenced by the weird variety of road convolutions. In this site planning there is no sense of unity, save for that given by the monotonous uniformity of the houses themselves. There is no climax, no skillful or even logical development of inner roads leading to a community center. Instead there is a veritable nightmare of supermonotony, a pox of jerry-built minimum shelters broken out as far as the eye can see upon what had formerly been a fine, wooded and orchard-studded landscape. But even before it could be completed, the finishing blow to this project, as an effort at community planning, came when the contract was recently awarded for the construction of 700 units of apartment row houses, to be placed on the few open spaces planned for the site.

After it was realized that single houses, no matter how flimsy and sub-standard they might be, could not meet the more and more urgent demand for housing, the "war apartment" phase began. The first large group of war apartments was a 2000-unit project, made up of one- and two-room apartment blocks containing eight to sixteen units each. The blocks are connected by heating ducts to a service unit furnishing heat, hot water, and laundry facilities. The design of these originated in Washington; site planning could hardly be on a level higher than that involved in packing sardines in a can. After spectacular appeals in the press and radio for construction labor, the work went ahead at first very quickly; in 41 days shelter was provided for 72 war workers. On January 5, 1794 units were completed and 1763 occupied. The sprawling community building (containing administration offices, trading post, recreation rooms, infirmary, and cafeteria), and a separate commercial building were practically completed by January 5, but not in use save as rental offices.

But the really amazing colossus of Portland housing, and in fact the nation's largest single housing project, is Vanport City, first called "Kaiserville." A $25,102,000 development started in August, it consists of 9,914 units, and with its 40,000 future inhabitants will become Oregon's second largest city. Typical housing units at Vanport consist of four two-story apartment blocks, grouped around a central service unit which furnishes heat, hot water, and laundry facilities. The site is swampy ground honeycombed with necks of the Columbia slough, necessitating fill and a special pumping system. During the months of heavy rain this winter, conditions were almost impossibly bad for construction. On January 5, 1034 units were completed and 908 occupied, considerably behind schedule. Hundreds of construction workers, many of them women, have been slogging around in deep mud in the effort to finish 500 units a week until Portland's "Muddy Miracle" is completed. Still unfinished, and in some cases, not yet started, are the community centers, theatre, five school buildings, administration and other municipal buildings. *(Turn to page 55)*



Courtesy Vancouver Housing Authority

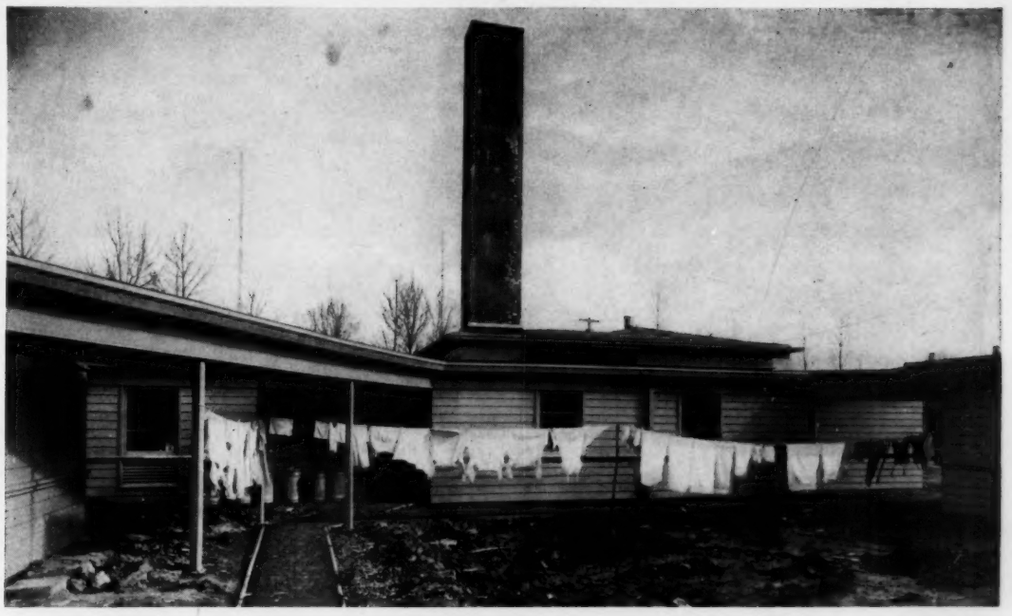
McLoughlin Heights, near Vancouver, Washington, adjoins the huge Vanport project, commonly called Kaiserville, which is visible in the right background. The efforts to avoid monotony at McLoughlin have resulted in a certain amount of disorder. But the houses are neat and are set on relatively large plots.

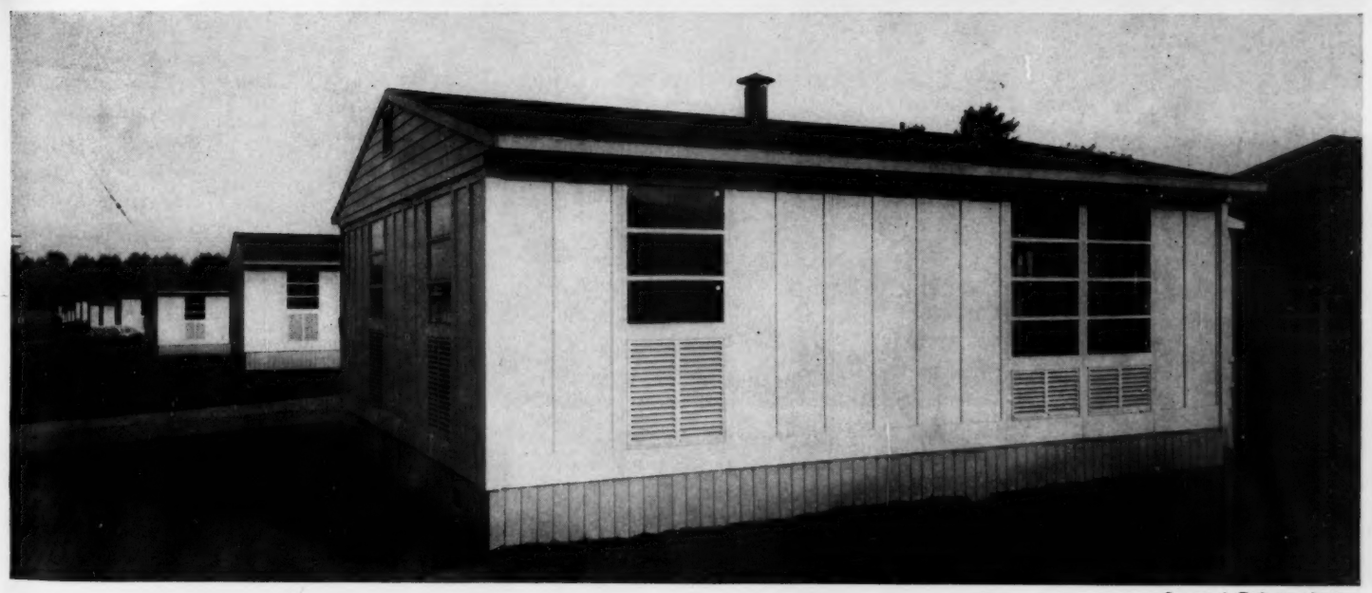
Vanport City, perhaps better known as "Kaiserville," now is to include 9,914 family units, will accommodate 40,000 people, will be Oregon's second largest city, and will cost over $25 million. Wolff and Phillips are the architects. It was reported considerably behind schedule last January; on the fifth, 1,034 units were complete, 908 occupied. The site is swampy, necessitating fill and a pumping system. Hundreds of construction workers, including many women, have been slogging through this muddy miracle during the winter trying to finish 500 units a week.

Henry J. Kaiser's shipbuilding company hopes to house part of its force in Vanport. Photos show, top to bottom, a general view; several four-family apartment buildings grouped around an internal court, mostly parking space (a typical arrangement); and a long, long street of completed apartments. Details were fairly closely supervised by The Kaiser Company. Density is very high.

Vanport, according to Wolff and Phillips, its architects, has under construction (and in some cases, completed) five 13-room school buildings, a 200-bed hospital with surgeries and out-patient facilities, two large social centers containing theaters, club rooms, and other recreational facilities, four smaller social centers, two shopping centers, one fire and police station with four sub-stations, a post office, and six maintenance buildings. A large municipal park and golf course adjoin.

At right is a typical service unit for 48 apartments in Vanport.





Leonard Delano photos

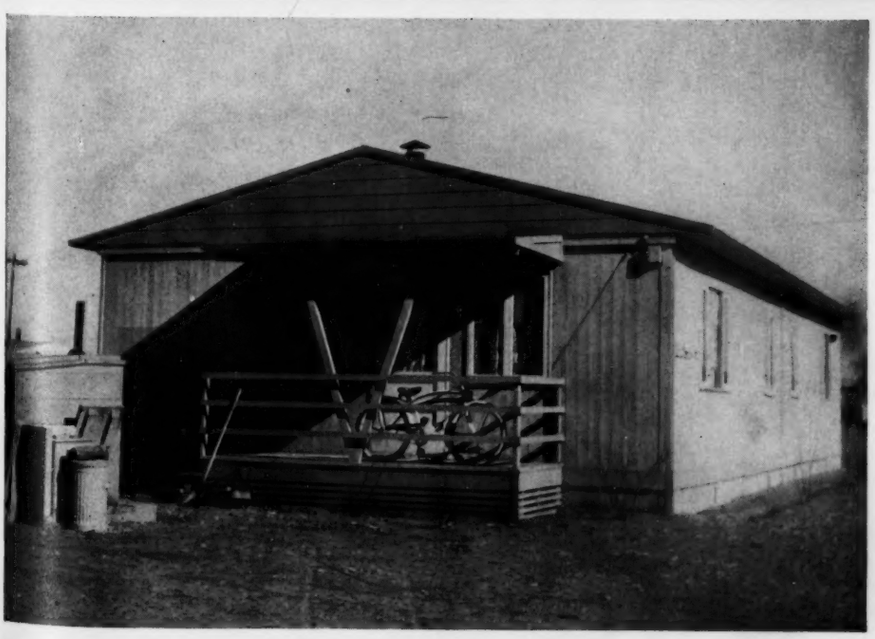
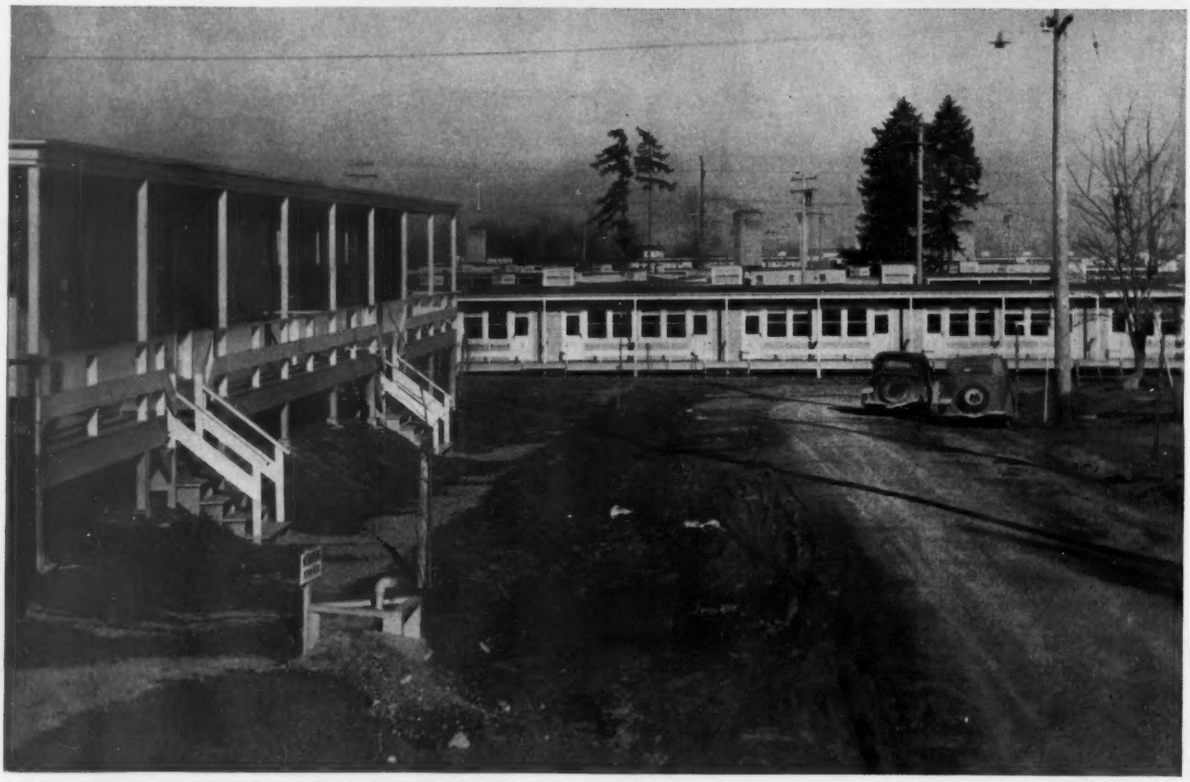
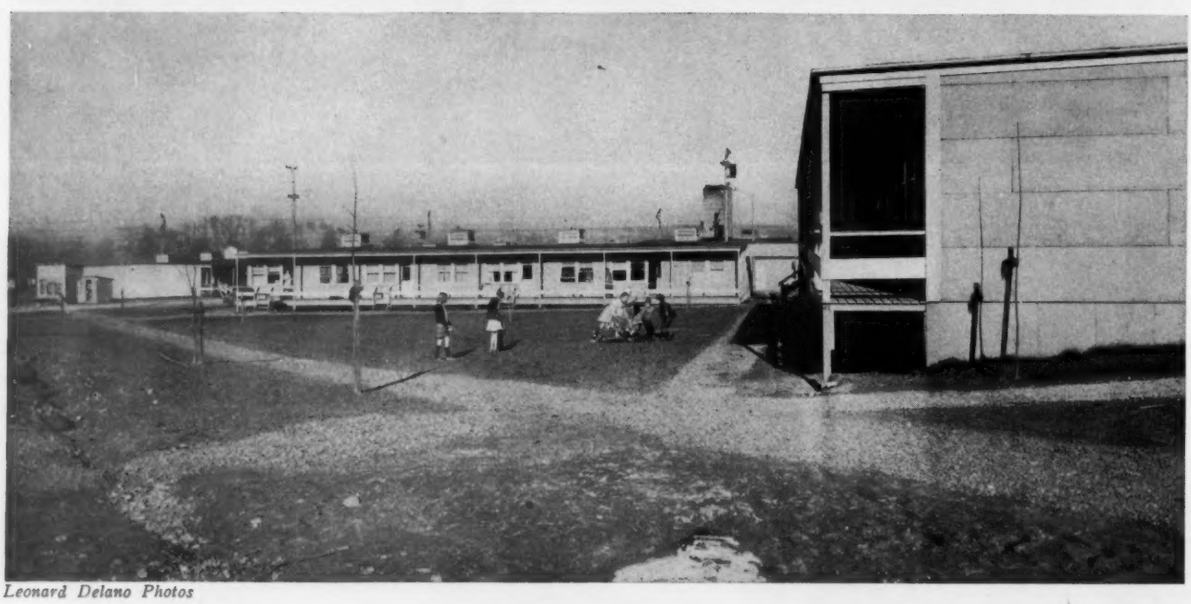


Photo above shows typical view in Parkside Homes (temporary housing; Johnson, Wallwork and Dukehart, Architects) and, at left, typical single unit in Guilds' Lake Courts (Whitehouse and Church, Architects). The latter house is similar to those built at other Portland projects and at McLoughlin Heights.

(Continued from page 51)

seriously concerned with the shortcomings of local housing efforts.





Leonard Delano Photos

Photos on these two pages are all of University Homes, A. E. Doyle and Associates, Architects. The top photo shows a public housing project (University Homes) on the right side of the road, a privately-built project on the left. Note the effect on design of the Federal promise that the public project would be temporary. Center photo, general view. Lower photo, buildings laid out so that they partly enclose a yard for children's play. Across-page, a typical four-family unit porch. In all these projects, the architects were given little part in choice of site or of building units, in selecting materials, or determining density. They were told what to do, and had to do it.

(Continued from page 51)

There have been numerous other smaller projects started which have bumbled along to completion or partial completion, hamstrung most of the time by material shortages, red tape, and occasionally, labor difficulties. In the meanwhile, the trailer cities have continued to exist and well-paid war industry workers have been living, often with new refrigerators and furniture, in vacant stores and abandoned barns. In desperation, the Kaiser Company built several thousand units in single and double room dormitories for single workers in the Vancouver and Swan Island shipyards, but this expedient failed to provide for new workers with families who make up the majority. Tragedy struck one of these Kaiser "Hudson House" dormitories in October, when eight men were killed in a fire which consumed the building in three minutes.

Speed has been the watchword among all the Portland housing officials and architects, and undoubtedly the urgency for swift provision of housing has been great. The Vancouver master plan was made in ten days and other basic decisions on all the projects have been arrived at even more quickly. During periods of preliminary work on a project, FPHA men, architects, draftsmen, and stenographers, are in a state of continual, jitterbug motion. The spirit prevailing in the offices is almost inevitably one of: "O. K., boys, the heat's on, there's no time to study the thing. We've got to get it all out by 10 a. m. tomorrow." Architects and draftsmen are at the boards ten to fifteen hours a day, and at the end of ten days of this pace, are haggard, careless, at minimum efficiency. Finally the drawings, with elaborate titles neatly lettered, are turned over to the blueprint boy to produce truckloads of prints to submit to the housing authorities.

Weeks later, when work begins on a project, one wonders why a few more hours could not have been allowed to study the site plan. Months later, when the project is only partially complete, the remainder of the buildings standing empty and stark waiting for pipe traps and wall plugs, it seems downright catastrophic that so much frantic effort, so much money, should have been expended to produce so little quick housing and such spiritless mediocre results.

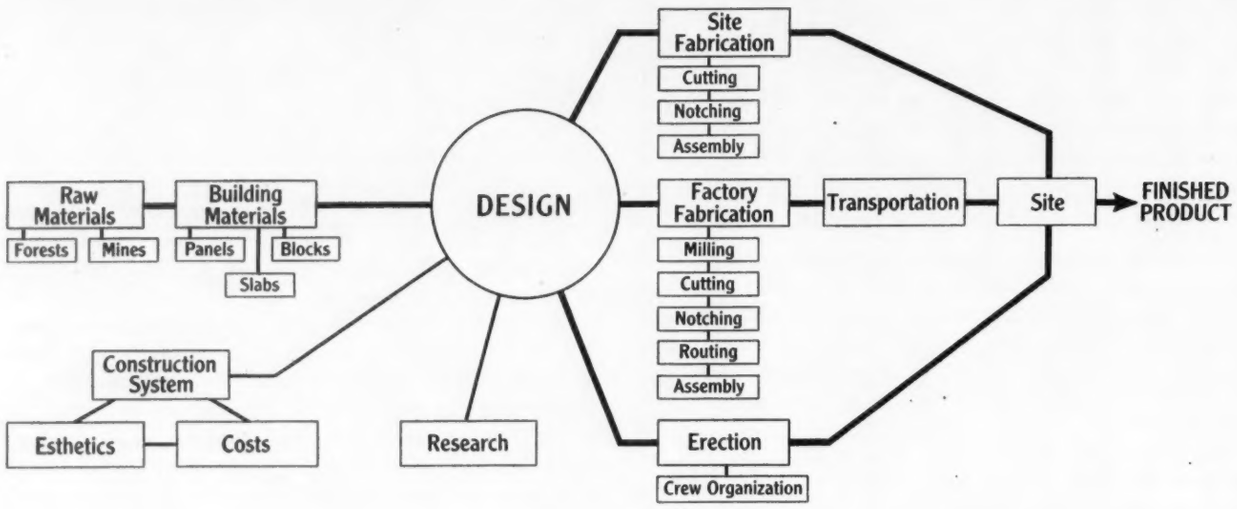
It is probably true that hardly more than a few Portland architects are seriously concerned with the shortcomings of local housing efforts. There is a good deal of cynicism about government inefficiency, and yet at an AIA meeting called to discuss the Vancouver housing situation, the complacent conclusion was reached that cooperation of architects on the McLoughlin Heights project could not have been possible in the short time allowed for site plans. Only ten days or so were allowed, yet it has seemed to some architects in calmer moments that even three or four hours of this time might have been spent in discussion of common problems to the advantage of more unity in the relationship of sectors.

Extravagant as it has been, the educational value of this experience to all concerned cannot be denied. Some of the basic modern principles of the design of neighborhoods have been learned by local architects the hard way. Even on the hastiest site plans, housing units have been kept off main traffic arteries, provision has usually been made on the plan, even if not carried out, for open play spaces and community facilities. Finally, the concept of the individual house as a home in a neighborhood, for which decent nearby community buildings should be available, has now reached the general acceptance stage, among architects, at least. Housing authorities have been organized and given vast and trying experience. The Portland public has become accustomed to the sight of whole communities springing up at once, and many individual war workers, for whom it is often a novelty, have come to enjoy modern plumbing and cooking facilities and the experience of living in light unpretentious houses.

It is, of course, unfortunate that a greater number of permanent, tangible benefits could not, through lack of preparation, have resulted from Portland's harrowing housing experience. Through lack of a housing authority, and the absence of any serious planning for long-range expansion of traffic arteries, industrial sites, and housing, no blighted areas have been cleared, and very little permanent housing has resulted from the tremendous government expenditures. Instead, Portland is faced with a terrific postwar problem of preventing its unexpected temporary communities from becoming vicious slums to be added to its pre-war slums, which came through all the new housing efforts untouched.

Prefabrication Pattern

by Samuel Paul, of Matern, Graff & Paul, Architects



It seems important to us, the Editors of New Pencil Points, *that an architect-prefabricator should speak his mind on the present status and future possibilities of the still untried prefabrication industry. (We say untried because, on the basis of the present unnatural conditions, any assessment of what it might produce in normal times is guesswork.)*

It seems equally vital that the importance of the designer in this field be made clear. The business of production and the engineering of the system are, of course, essential parts of the pattern; but in this type of shelter the need for designers who control is possibly more imperative than it is in the case of custom-built houses, public buildings, or many another kind of structure. Certainly, prefabrication design is far from easy.

At no time has Mr. Paul been under pressure to stress this or that phase of his subject, beyond an occasional stimulus to say what was in him. His words are his own.

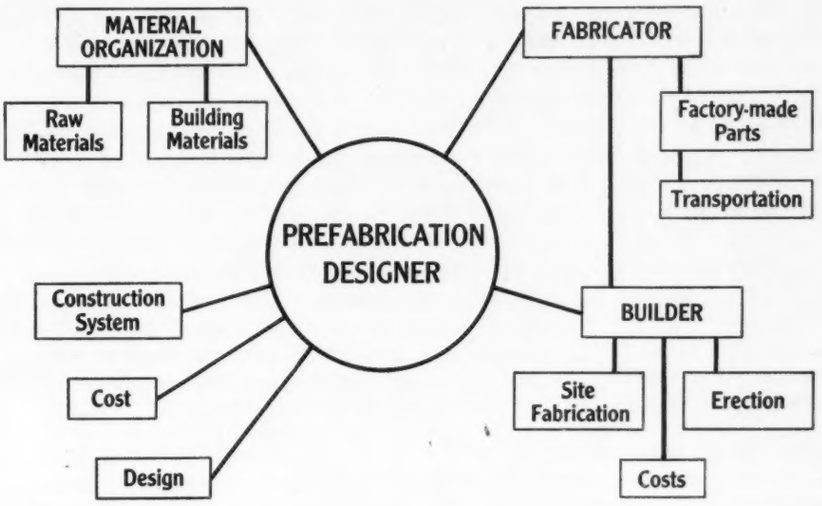
Prefabrication is overall building planning from raw material to finished product. Design, factory fabrication, field fabrication, and erection are organized and coordinated on the basis of mass production. The conception of prefabrication involves several variations. One is the manufacturing of the entire structure in the factory—perhaps made up in two or three large sections—and transporting it to the site on trailer trucks from which the sections are immediately erected. Another is the making up of panel units in the factory—units which can be handled by two to three men and do not require machinery for erection, units which are not too bulky for compact stacking in transportation, units which require precision work. The bulky units which are difficult to transport are requisitioned for site fabrication. Still another conception of prefabrication is total site fabrication. However, no matter what the variance may be in the degree of factory fabrication, the overall pattern remains somewhat constant.

There are relative degrees of prefabrication, even in conventional construction. The standard-built house has so many factory-made parts—windows, door frames, kitchen cabinets, etc.—that such a house might have been called prefabricated twenty years ago. This evolution toward prefabricated parts in the conventional house is slow but continuous. The kitchen and bathroom have made the most substantial progress in this respect. The result may be that as time goes on it will be very difficult to distinguish between a prefabricated home and one of standard construction. As an illustration of this trend the Federal Public Housing Administration, on temporary housing, has adapted as its standard construction prefabricated trusses, interior and exterior wall panels, and studs two and three feet on centers. A prefabrication system which competes against the FPHA *standard* construction is in reality competing against another prefabrication system.

Brief Resume of Prefabrication to Date

In the decade from 1930-1940 the prefabricated house progressed from the nebulous and vague state into something real. There were many proponents and opponents of the prefabrication movement. Several endowed organizations—Pierce Foundation, Bemis Foundation, Purdue Research Foundation—aided its development. But until recently it consisted mainly of ideas, theories, and experiments. Many large companies experimented with prefabrication as a special venture. Most of the accomplishments were either on paper or in an experimental house erected for study and research purposes. The demand for such type of housing was uncertain. The cost was not low or attractive enough to the prospective home owner to invest in a new type of structure. The war emergency gave prefabrication its first real test in the field. Speed, efficiency, elimination of critical materials, low cost, flexibility, and pleasant design were the main requirements for the much needed homes for war workers. The government in one form or another became the main customer, inasmuch as all private work in non-war areas was halted.

Before the many government housing agencies were combined into one integrated housing organization now known as the National Housing Agency, there were differences of opinion among them on prefabrication. Some adhered rigidly to standard construction; others were more progressive and stimulated the use of the prefabricated house. The Farm Security Administration, the Tennessee Valley Authority, and the Public Buildings Administration gave prefabrication the chance for which it long had been waiting. FSA accepted many prefabricated systems for its communities, farm buildings, market centers, and community centers. Although TVA started out by building conventional structures, it later sponsored factory-fabricated houses which were



These two charts illustrate the importance of the designer in the prefabrication picture. On page 56 the functions are integrated; on this page is charted the organization for executing the pattern. The organization may be an association of individual groups, or a single unit.

trucked to the site in two or three large units. PBA created a field laboratory for various prefabricated systems at Indian Head, Maryland. The FHA, a unit of the National Housing Agency, perhaps the most conservative of the housing agencies, and most rigidly bound by rules and regulations, relaxed its requirements to encourage small house construction. Many prefabricated systems have been approved by FHA and are eligible for a mortgage rating.

The Prefabrication Designer Created

Still having many opponents, the prefabricated house by 1941 was firmly established as one answer to the acute housing shortage. In some instances, the case for prefabrication was harmed because the factory-made parts did not fit together in the field. As evidenced at Indian Head, Md., the design of the homes was so boxy, unimaginative, and uninteresting that officials were skeptical of the possibility of designing a good-looking prefabricated house. In other instances, the factory-made house was more expensive than the standard constructed house, which immediately raised a doubt as to the advantage or necessity of prefabrication. Perhaps the main reason why some prefabrication systems failed was because the prefabrication pattern was lacking in one or more departments. For example, some prefabricators stressed factory fabrication with much too little thought to design or erection; others put the importance on new materials with little stress on factory fabrication. As an approach to prefabrication it seems desirable to have an overall plan or pattern from the raw material to the finished house which gives relative importance to each step, phase, or department. The person who can coordinate all these steps from beginning to end might be termed a prefabrication designer. Although as yet there are no planned university courses for the prefabrication designer, the architect is well equipped to develop himself into one. He is trained to have a flexible mind, to use whatever imagination and ingenuity he has. He has a good understanding of construction and in addition is thoroughly drilled in architectural design. The prefabrication designer should be a peculiar combination of technician, architect, artist, and organizer. He should have a thorough knowledge of materials—their qualities, characteristics, structural strength and limitation; of factory fabrication—mill procedure and organization; of site fabrication; of field erection—organization of crews and procedure of construction; of costs, transportation, and architectural design. The prefabrication designer will be more in demand as his importance is recognized in the pattern of prefabrication. In order to be complete, the pattern of prefabrication should include the material organization, the prefabrication designer, the fabricator, and the builder. These organizations may be integrated into one large prefabrication company or may be individual companies working very closely together. The prefabrication designer, in addition to the possibilities mentioned previously, may also be a consultant.

Approach to Prefabrication

The procedure that a prefabrication designer takes in developing and producing a prefabricated house may be broken up into six main headings as follows:

1. Development of a system of construction
2. Construction of an experimental house
3. Production drawings
   a. Factory-made parts
   b. Site fabrication
   c. Erection diagrams
4. Supervision
5. Costs
6. Continued improvements

(Continued on page 58)

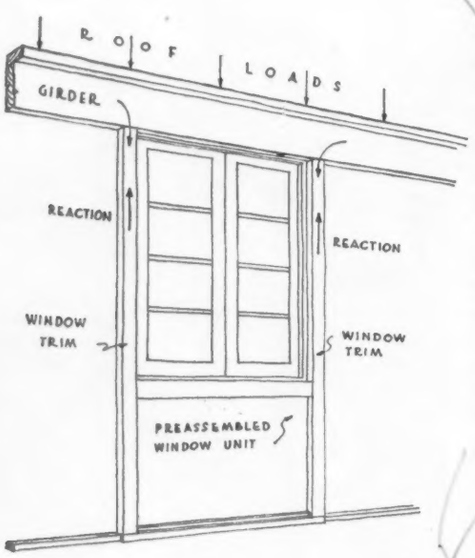
Above, erecting exterior walls for a Matern, Graff and Paul prefabricated house. Below, starting interior partitions with door units.

PREFABRICATION PATTERN

Development of a System of Construction

A system of construction may be developed along two different lines. One method simplifies and organizes standard construction into prefabrication. In this method the construction principles remain the same as in the conventional-built house, but the method of erection differs to a great degree. The exterior walls, floor framing, and other parts of the house may be made up in large panels of traditional construction, i. e., 2x4 studs 16″ o. c., etc. Simple, straightforward methods are used in joining these parts together. A standard unit of measurement, the module, is often used. It may be a dimension which divides easily into stud spacing, 4′ wide wall boards, doors, windows, etc. Another line of procedure is to invent a new system of construction based on large units which embody rules of construction different from the traditional. This approach will afford greater flexibility and, in the long run, will probably achieve better results. The prefabrication designer develops a construction system to achieve such significant results as minimum materials, minimum waste, minimum parts, simplicity in erection, elimination of as many operations as possible, and low cost. Of prime importance is the selection of materials. Before any drawing is started research work should be done to determine the materials available, their cost, and physical qualities. Sheet and panel materials such as plywood, asbestos cement on each side of a rigid insulation core, compressed wood fiber panels, and compressed paper present the prefabrication designer with numerous possibilities, despite the war. Organic architecture is a basic principle in developing a system. The prefabricated structure should be stripped of all superfluous ornamentation. To be truly organic, the structural elements are not concealed or covered up, but form an important part of interior or exterior design.

Schematic illustration of a principle of the Matern, Graff and Paul prefabrication system: Window and door trim, which are integral panel members, act as the posts of post-and-lintel construction.



EXTERIOR WALL
VIEW FROM INTERIOR

In the system developed by Matern, Graff and Paul, known as MGP Prefab, the principle of organic architecture was stressed. An important feature of the system is that the window and door panels act as columns. The load is transmitted from a wood girder above the window head, through the window head, and then down through the window jambs and trim to the foundation. The window trim is a load-bearing member and at the same time a trim piece. The construction system is of the post and lintel variety. A milled 2″x12″ girder spans from one supporting window panel to the other. This member takes the roof load from prefabricated trusses. It is exposed on the interior. The exterior wall panels are non-load bearing and can be of many varieties. The wall panel type that was used on a recent project was only 1½″ thick. It was made up of a 1″ thick wood fiber insulation core laminated on both faces with ¼″ plywood. The facing material may be compressed wood, asbestos cement, or gypsum depending on the availability of the material. The interior partitions are all non-load bearing. The exterior walls are erected in one operation as contrasted to seven operations in the conventionally-built house.

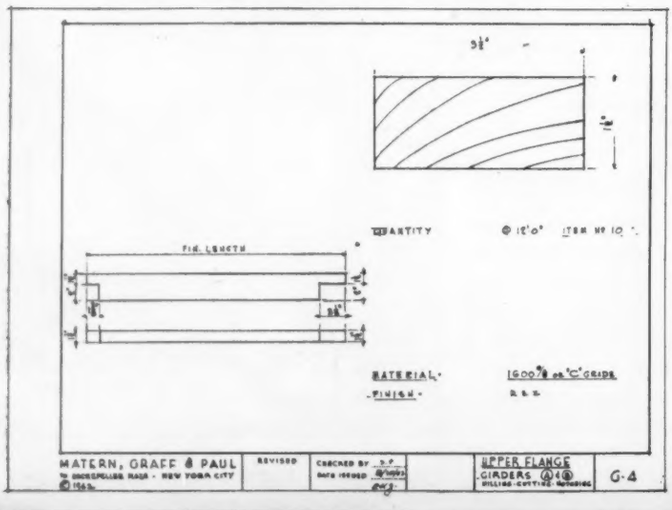
After the system of construction is worked out, laboratory tests should be made for strength and racking. During this period the construction is refined to a degree so that there is neither too little nor too much material to take the required stresses.

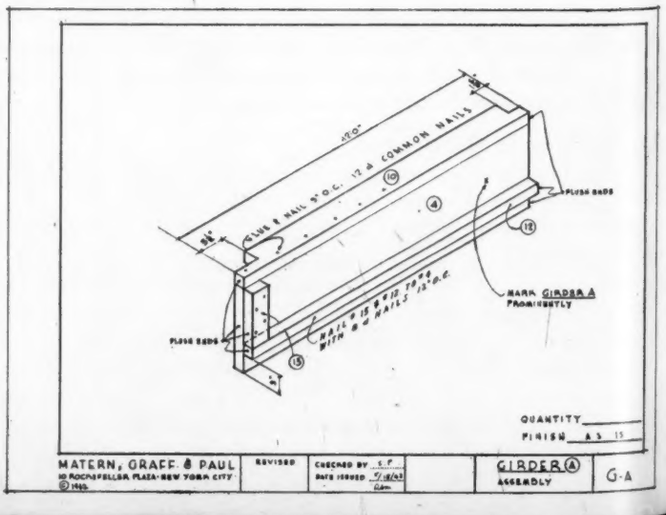
Construction of an Experimental House

The next main step is to construct an experimental house to test the system of construction in its entirety and to see that all the parts fit together. During its construction complete reports and progress photographs are made, details are refined and improved, and handling of materials is studied.

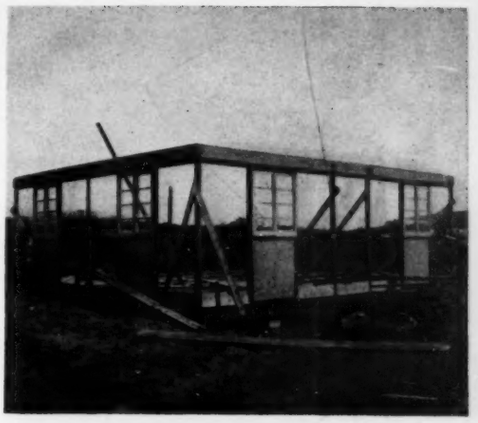
In the experimental house built by Matern, Graff and Paul to test the MGP Prefab system, it was decided to carry prefabrication beyond the exterior shell and interior partitions into the furniture. For a low-cost home it seemed fitting that the furniture should be low in cost also and yet harmonize with the design of the house. Matern, Graff and Paul collaborated with a

These four drawings are typical work sheets for various phases of the job, reproduced from Matern, Graff and Paul's original standards. Below, at left, drawing used by the fabricator for selecting rough material from stock, for grinding knives and setting milling machine for one part of the following assembly. At right, drawing used in assembling milled and cut parts.





furniture designer and designed special furniture which reflected the spirit of the prefabricated structure inasmuch as the same principles of prefabrication were applied to the furniture as in the house. Rational and organic design was stressed. Most of the furniture was made out of the same plywood as was used in the exterior wall panels. The scale of the furniture was in keeping with the scale of the house. The idea of good design at low cost was carried further into the drapes and rugs. Inexpensive, synthetic fabrics were selected for the drapes, and a linen fabric was used for the rugs. To complete the ensemble, original water colors and small sculptured pieces were purchased from artists whose prices were low enough for the low-income group bracket.



Assembly of two outside walls shows use of window units to support the plate.

Production Drawings

After a thorough analysis of the experimental house has been made from the standpoint of construction and design, complete drawings of the various stages of production are made. They include material cutting diagrams, millwork drawings, site fabrication drawings, and erection diagrams. During this stage the prefabrication designer works very closely with the material man, the mill, and the builder. Although most of the wall panels are of a standard size, inevitably some will require cutting to special sizes. Diagrams are prepared to show how these special sizes may be cut from stock panels with minimum waste.

Millwork

The millwork drawings are prepared according to shop procedure. It is often difficult to determine what parts should be manufactured in the mill and what parts should be made up on the site. We have reached the conclusion that parts which require precision work and are to be a finished material—parts that transport easily and do not weigh too much—should be factory made. The rough lumber parts which are bulky and heavy and which do not require a milling operation and special machinery should be made up in the site shop. The finished units in our system include columns, girders, windows, doors, facia, rake, kitchen cabinets, and closets. Before proceeding with the millwork drawings a complete study of shop practice should be made including limitations of machines, how the men work, and general organization.

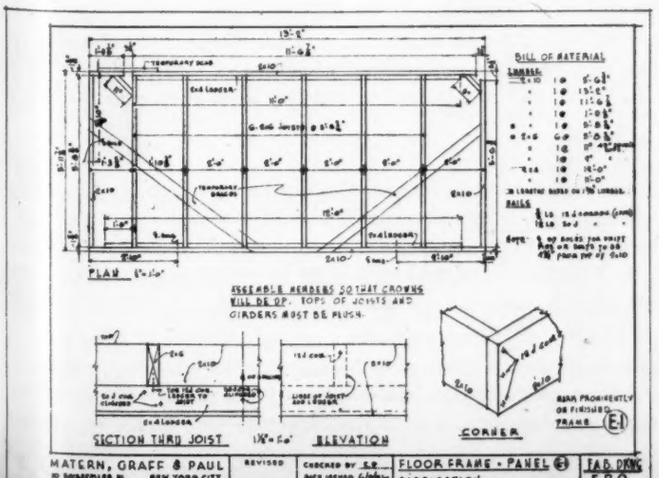
In order to have a clear picture of mill practice on a mass production basis let us follow the journey of one stick of wood from its rough state to its place in an assembled unit. It is taken out of the stock room and makes its first stop in the milling department where it is milled to a specific cross section. From here it goes to the cutting department where it is cut to a definite length. If a notch or a rout is required it proceeds to the notching and routing departments from where it goes to the assembly section. Here it is given a number and placed in its proper rack. The assembly man takes the marked piece out of the rack and with other pieces assembles a unit. It is now ready for a prime coat of paint. After the painted unit is dried—a quick-drying primer is used—it is taken to the warehouse from where it is trucked to the job. The means of conveyance from one department to another may be by belt or by dollies.

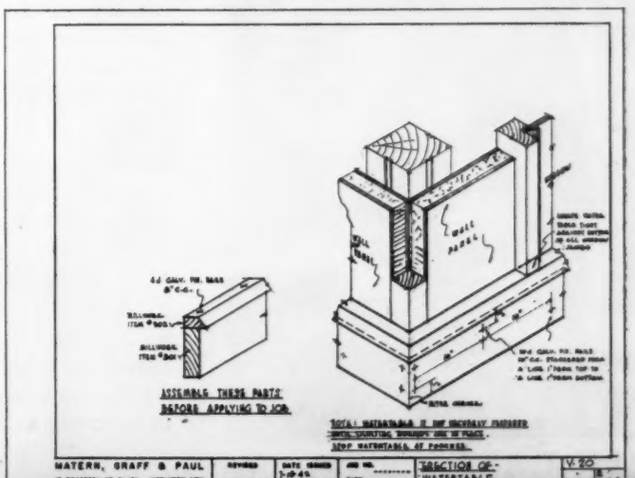
The drawings required for the procedure described above may be outlined as follows:

1. Separate drawings for each operation such as milling, cutting and notching, routing and assembly.
   a. Wherever possible stock pieces of lumber are used.
   b. Waste is minimized.
2. The assembly drawings.
   a. Often done in isometric or perspective.
   b. A production illustration rather than a blueprint.
   c. The assembly units are designed to stack compactly for transporting.
3. Jig drawings are made for the assemblies.

(Continued on page 60)

At left, drawing used by the field shop for site fabrication. Note that the bill of materials and even the position of each nail, are included. Below, this type of easily-read illustration, rather than flat-plane working drawings, speeds assembly and increases efficiency of field construction. (Conventional construction also would undoubtedly benefit from use of such drawings!)





On these two pages are photographs and drawings of the latest Matern, Graff and Paul experimental house—one which resulted in the award of Government contracts to the firm. In addition to the usual minimum of interior equipment, the architects believed it to be a part of their job to make sure that adequate, well-designed furniture was available. C. Coggeshall collaborated on this phase of the problem.

Site Fabrication

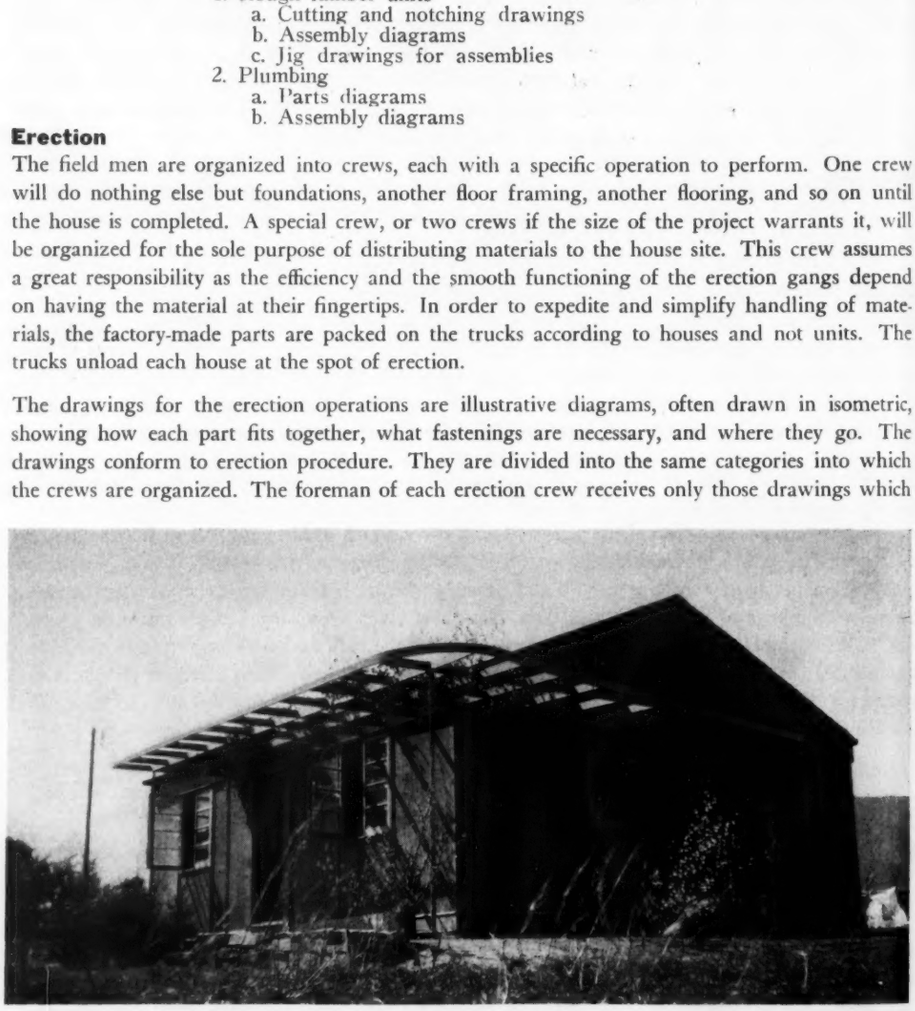
The field fabrication shop is usually in a central location adjacent to the project. The enclosure may be nothing more than a tent-like canvas cover. The fabrication equipment may consist of overhead circular saws, bench saws, electric saw, perhaps an electric drill, the number of each item depending on the size of the project. In addition, adequate benches and jig tables are needed. In the MGP Prefab system the following rough lumber units are made up in the site shop: floor framing panels, trusses, ceiling cats and sheathing panels. One part of the field fabrication shop can be used for the manufacture of plumbing sections. Here the rough plumbing members are cut to length and assembled into workable units. The drawings for site fabrication follow the same pattern as for the mill drawings. They include the following:

1. Rough lumber units
   a. Cutting and notching drawings
   b. Assembly diagrams
   c. Jig drawings for assemblies
2. Plumbing
   a. Parts diagrams
   b. Assembly diagrams

Erection

The field men are organized into crews, each with a specific operation to perform. One crew will do nothing else but foundations, another floor framing, another flooring, and so on until the house is completed. A special crew, or two crews if the size of the project warrants it, will be organized for the sole purpose of distributing materials to the house site. This crew assumes a great responsibility as the efficiency and the smooth functioning of the erection gangs depend on having the material at their fingertips. In order to expedite and simplify handling of materials, the factory-made parts are packed on the trucks according to houses and not units. The trucks unload each house at the spot of erection.

The drawings for the erection operations are illustrative diagrams, often drawn in isometric, showing how each part fits together, what fastenings are necessary, and where they go. The drawings conform to erection procedure. They are divided into the same categories into which the crews are organized. The foreman of each erection crew receives only those drawings which



pertain to the operation which his crew performs. For example, if a crew is assigned to erect exterior wall panels and windows, the foreman of this crew will receive only the drawings which show how these elements fit together.

Supervision

The prefabrication designer supervises all the items made in the mill and site shop so that they come to the place of erection with quality, fine workmanship, and precision. Supervision is required in the field until the crews are broken in and become proficient in their operation. It usually takes between twenty and thirty houses before the crews are properly coordinated. At the beginning of a project one crew might be overburdened while another may not have enough work. The problem is to balance the work of each crew so that they work like a smooth-running machine.

Costs

Whether a prefabrication system succeeds or fails depends to a great extent on the final costs. Prefabrication must give more value than the conventional house to warrant the change to it. Of utmost importance is the simplicity in the construction system—one which can be built easily and quickly. Other factors which contribute toward lowering the cost of the house are the proper selection and use of materials, efficient organization in the mill, field shop, and field, and smooth coordination between the factory and the field.

In order to establish prefabrication it is mandatory that the initial cost of new machinery, dies, etc. be kept to a minimum. A prospective prefabricator will not invest a huge sum of money in converting his plant to function according to a prefabrication system until he has experienced

a satisfactory profit from it. Many prefabrication systems have never gotten past the paper stage because the initial cost of getting into production was prohibitive.

The prefabrication designer furnishes the mill and the builder with a complete breakdown of materials and any cost data which will aid them in estimating the cost of the structure.

Continued Improvements

The work of the prefabrication designer does not stop with the completion of the first project. During its construction he keeps a watchful eye on all details and makes notes of those which can be improved. After people have moved into the houses he can conduct a house-to-house survey to get the public reaction to the layout and general design. With this information the prefabrication designer continues to improve and evolve the house so that it is always up-to-date and in a state nearing perfection.

Prefabrication Designer in Postwar Period

While the prefabrication designer is contributing toward the solution of the wartime housing shortage he is also thinking about the postwar housing shortage and how it can best be met. Many estimates have been made as to the number of houses that will be demanded after the war. These range from one million to two million houses per year for at least a ten-year period. This does not include the potential market that may be reached through the production of $1,500-$2,000 houses. It also does not include the housing demand that will exist in other countries. Prefabrication is thus presented with an opportunity that may make it one of the largest industries in the world. Up-to-date prefabrication has shown that it can build houses more efficiently and more quickly than the conventional-built house, that it can build sturdy, comfortable, and permanent houses. Although prefabrication has not shown a substantial decrease in cost, there is reason to believe it will. During war time the prefabricators are not able to tool up or organize on a permanent basis. Constant government changes require flexibility. Also, the work of the prefabricators may not be continuous. However, after the war these conditions will not exist.

The prefabricator will have three main customers after the war—the individual, the developer, and the government. Distribution of the houses to the individual will present the biggest problem. There are several possibilities. One is the distribution through a lumber dealer or building supply dealer. He might carry either a complete packaged house, or special parts such as panels, millwork, etc. Erection diagrams may accompany the parts sold so that the carpenter-builder will have no difficulty in putting the parts together. Another possible distributor is the department store. For successful distribution through this agency it will be necessary to package the house completely. Still another possibility is an independent sales agency which will function like an automobile sales organization. Of the three types, the last will present the most modern and progressive merchandising technique.

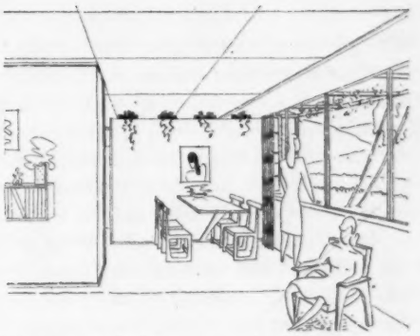
The house developer will buy prefabricated houses provided he is shown that he is getting a saleable product from which he can make a satisfactory profit. He might ask for certain modifications in design to give his development an individual air. There is no doubt, however, that the large project offers the builders all the advantages for prefabrication.

It seems inevitable that the government will continue to sponsor low-cost housing after the war. Prefabrication will be one way of replacing slum and blighted areas.

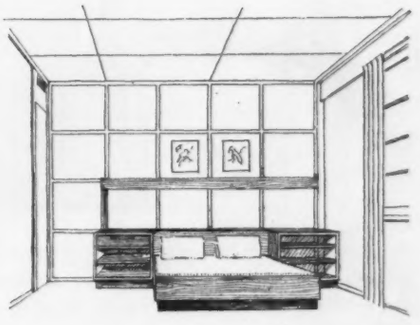
Perhaps the biggest obstacle prefabrication will meet in the postwar period will be local building codes which, in general, are based on conventional construction. However, several cities are now revising their building codes to be general enough to include prefabrication. The stand that labor will take is uncertain. Labor must be shown that it has everything to gain by accepting prefabrication. Although the number of man hours on the site per house are reduced, the work in the factory is somewhat increased. This means that the skilled mechanic has a better chance of having steady work, rain or shine. Although his hourly rate may not be as high as in the field he will average more money per week in the factory. The mechanic will not only gain by having steady work, but he will also gain by having an opportunity to own his own home.

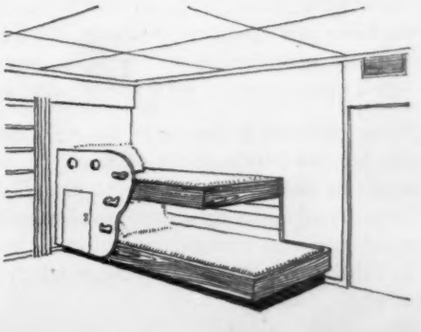
Future Design

The prefabricated house will be less bound by style and tradition than conventional houses. New sheet materials are constantly being developed which are adaptable to prefabricated and mass-produced homes. After the war, aluminum, steel, copper, and other metals, and plywood and plastics will be available, in addition to materials now available such as compressed paper, and asbestos cement on both sides of a rigid insulation core. The form of the house will follow the material employed. The low cost of the prefabricated house will be a strong selling point and will outweigh the desire for a traditional design. The architectural design will be, to a great extent, controlled by the system of construction, mechanical and electrical equipment, by materials, function, and social conditions. It is possible that within the next twenty years the prefabricated house will change in substance and form. Unusual, imaginative, and ingenious ideas, some frankly impractical, are being contributed to the development of prefabrication. Among them are the mast-hung-type house, the igloo house, and the rigid frame house. Out of all this may come a new invention which may be as revolutionary as the automobile.



Interior of living room, looking toward dining alcove. Sketches are by the author.





Above, large bedroom with semi-built-in bed. Below, small bedroom has bunks, a variation from the scheme shown in the plan on page 60.

On Architecture and Architects

An address by BERNARD RUDOFSKY, delivered at the invitation of the Fogg Museum, at the Boston Museum of Art, in the course of the exhibition of Brazilian Architecture, "Brazil Builds."

Whoever has given the most casual glance to the current exhibition of Brazilian architecture will be confronted by a string of questions, supposing he is concerned at all with cultural manifestations in foreign countries. Here, he is told, is the most advanced and promising architecture in the entire hemisphere. How, then, does it happen that he has never had the slightest notion of such a phenomenon? Who are these people who work quietly, without annoying the rest of the world with tales of their deeds? What drives these Brazilian builders and architects, and why has their government not failed them? And why was Brazil qualified to carry European ideals to fruition when the lights went out in their home country?

It should be said in parenthesis—and at the risk of being obvious—that the Brazilian case is not isolated, but rather the continuation of an evolution of architecture existing in Scandinavian, Central-European and Mediterranean countries. The recent discovery of Brazil results from a happy coincidence of several factors quite extraneous to architecture. Only the present war has made Americans aware of the necessity of nursing their interests in neighbors. Such a country as Argentina, which, besides selling beef, today has a most remarkable musical life, to Americans is still as remote as Atlantis. Yet, should Argentina for some reason or other abandon its neutrality it might become at once eligible for cultural interchange.

Brazilians are not publicity-conscious in spite of having a Ministry of Propaganda. They are extremely reticent in releasing personal data. That's why we are almost without any basis for judging the education of their successful younger architects.

We need not have any exaggerated opinions about the existing Brazilian schools and academies for art and architecture. These were among the *least* responsible factors contributing to the birth of the new trend in building. Nor have national publications, the contemporary ones as well as the old ones, ever sympathetically considered the new esthetic ideals. Inspiration was rather sought and found in its active sources—in Europe. And just as the painters' choice fell invariably on Paris, the aspiring architectural student went to Italy, the home country of architecture.

These travels were not by any means sentimental pilgrimages or Prix de Rome prize journeys to acquire the finishing touches on a placid academic education. South Americans went to the North Italian cities, which are less littered with awe-inspiring ruins.

Whoever wants to investigate the rapid and unexpected development not only of Brazilian, but of South American, architecture can not afford to overlook the history of modern Italian architecture. Many Brazilian architects grew up when that movement was under way and some older ones even participated in it. Very little is known about it in this country—again, for reasons which do not touch architecture at all.

In 1926, three years after the first soul-stirring Bauhaus exhibition in Weimar, Italy witnessed the first manifestation of similar events. It is quite characteristic of a Latin country that such a manifestation was revolutionary. Its protagonists were students. In a memorable exhibit of what they then called *rational architecture,* they assailed with unprecedented fury the prevailing training methods and pitilessly criticized their own teachers. This event provoked a long and heated battle and initiated an era of modern architecture in Italy.

The ensuing years of realization and the unending challenges between the genuine pioneers and the pseudo-modern architects of the reactionary Roman group were background and textbook for many Brazilian architects, who eventually carried the polemic spirit home. And another occurrence must have caught their attention: While such leaders as Gropius or LeCorbusier never got recognition from their governments in the form of substantial commissions, in Italy the acceptance and patronage of the State was responsible for some of the most brilliant realizations.

Brazil, which was intimately related to Italy in many cultural respects, followed the developments closely; and, when its own first architectural problems sprang from rapid expansion of its cities, quite naturally consulted foreign architects of merit. The invitation for planning the first great project, an enormous *cité universitaire,* went to the man then considered the architectural Holy Father, in Rome. (The project, fortunately, was shelved indefinitely.) Other important things occurred in Italy, to the great amazement of such architects as were able and willing to read European magazines. A group of students won a competition for one of Italy's important railroad stations and, what is more, built it.

In architecture, Brazil follows a pattern similar to the one so vigorously established in Italy. The government lends an open ear to the young and eager. It takes a keen interest in architecture at home and in foreign countries, wherever there is an intelligent approach to it. Contests decide the bestowal of commissions, and no narrow-minded nationalism prevents the inviting of foreign architects and artists. Not even the present war has made Brazilians crave national art, or has banned foreign artists from working with native ones. The recent invitation of Lipchitz to contribute a sculpture for a prominent site at the Ministry of Education is symbolic of their liberal thinking.

In connection with the current architectural show, it should be mentioned that Italian architectural magazines, open-minded and informed as they are, were the first and only ones to publish news of the remarkable building boom in Rio and São Paulo, and were able to show their readers photographs of the Ministry of Education as long as four years ago.

In 1938, when Europe abruptly stopped peaceful activities and mobilized all its capacities for war, when consequently its flow of creative

Photographs show, left to right, the Ministry of Education, Rio de Janeiro, Brazil; Brazilian Pavilion, New York World's Fair; Pentagon Building, Washington, D. C. Brazilian photographs are by G. E. Kidder Smith, AIA.

thought and invention to the new world dried up, Brazil had just grown out of her several serious economical and political crises. She was not willing to sit back for an indefinite time, waiting, but decided to make a start on her own.

Modern civilization had not disintegrated Brazil's roots in the past. One peculiarity, which is stressed in books on Brazil, is the patriarchal character of life. Family life, education, and the practice of a profession have successfully resisted destruction by overcivilization. The ideals of the young and the old had not become irreconcilable nor had they suffered the humiliations of modern life. Brazil had learned much from the errors of others and had succeeded in planning her growing industrialization in a sound and careful way, keeping alive her old traditions.

Dealing with Brazil's architecture only, we are most concerned with two essential elements: the craftsman and the architect. The skillful worker who strives for perfection throughout his life, and who has the urge and pride for creative work, is indispensable to the architect and can never be replaced by the unimaginative specialist. Brazil always had a constant influx of highly-skilled people from abroad who were not immediately absorbed by industry as happened here, but continued, under propitious conditions, to flourish, thus constituting a most powerful bulwark against the less desirable type of mass production.

The Brazilian architect likewise prides himself on having helped to maintain the purity of his vocation. His profession has as yet not been infected by the pest of decorators, designers, or architectural design factories. His success is very seldom expressed in terms of money or bulk of production. Nothing is more characteristic of his way of thinking than an incident which occurred in Rio a few years ago. The outcome of an architectural competition for a rather small, but comparatively significant, building had been very satisfactory for all involved—with the exception of the winner of the first prize. He defied the jury's judgement, maintaining that the best project had been submitted by a competitor who had won second prize. Yet nobody considered him insane, and his arguments must have been forceful because an arrangement was worked out to everybody's content whereby both winners agreed to join their talents and work together.

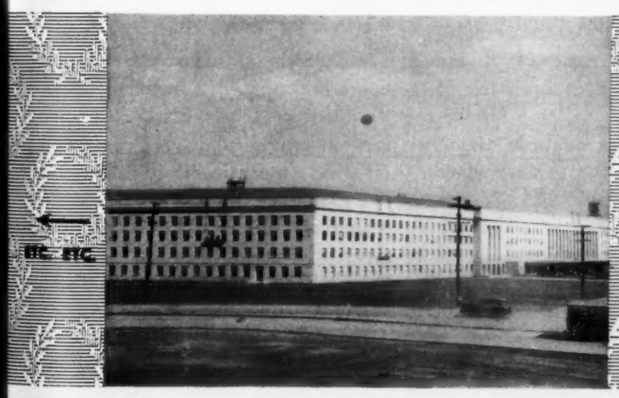
It is not uncommon to find young Brazilian architects working in groups, a system which has produced such excellent results in England and Italy. These partnerships, however, are not based on business interests or on pooling of financial backers. The Ministry of Education building is a monument to the effectiveness of such cooperation and to the humility of Brazilian architects. Its six authors are said to be receiving a fee which would hardly induce less idealistic people to move a finger.

Another aspect of the profession (which to American architects might seem quite odd, although it is taken for granted in Europe) is the complete absence of those frustrated robots, the draftsmen and renderers. The graduate Brazilian student undergoes an apprenticeship lasting many years, comparable to that of an artisan, whose goal is not just to convey to him an all-embracing training, but rather to implant in him the thought that not a single one of the manifold problems of planning should escape his attention or be left to the decision of others. One consequence is the Brazilian architect's disinclination to take more work than he possibly can handle himself, although it should be pointed out that the fabulous building activities of recent years, especially in the larger cities, have led to instances where a busy residential architect had at one time more than sixty individual houses under construction. None of these cases deserve our attention; they were not included in Mr. Goodwin's book* or the exhibition.

Still another result of the versatility so desirable to the Brazilian architect is the non-existence of the specialist, the expert who supposedly excels in one or two categories of buildings and therefore is eagerly sought by the client who thinks he needs that special type.

Speaking of the client, we might ask the question: What does the layman in Brazil think of this new architecture? And let us ask further in this connection: How does the American public like the Brazilian architecture presented in this show?

The optimistic critic, who hopefully foretold that the American public and especially the American architect would be shocked, was not supported by public opinion. More than one reason might account for the lack of interest. Architecture is, generally speaking, seldom a topic of discussion and, consequently, the average citizen is indifferent to it.



We had hoped to be able to present here a photograph, either of the building or of a rendering, of the vast new United States Embassy at Rio de Janeiro. But the State Department informs us that no photograph can be released; the building is still under construction and the renderings are not up to date. We have received varying descriptions, the most appealing being that the Embassy, which in plan covers three sides of an octagon, is of no style but does possess a cornice.

Since childhood he has been conditioned to his own environment; and, largely unaware of conditions in other countries, he accepts the prevailing belief that his way of living is the most desirable. He even succeeds in imbuing his world with a romantic, if nonexistent, beauty.

It is true that the architect, as the advocate of a better life, has completely failed his potential client. The architect who today is quite rightly looked upon as a businessman (and, because of his tinge of an artist, not as a very reputable one either) does not nearly enjoy the confidence that is so generously placed in the physician. Building, in the mind of the American citizen, never was necessarily connected with employing the services of an architect, and the rather complete disappearance of his profession since the outbreak of the war could but strengthen his belief.

There is no essential difference between the South American and the North American who employs an architect. However, Brazilians travel very much and, being Latins, have a genuine feeling for real comfort, while the American idea of comfort is somewhat distorted because it generates partly from his unshakable belief that he is the most progres-

* *"Brazil Builds," by Philip Goodwin. Museum of Modern Art, New York City.*

sive mortal, partly from the ability of the manufacturer to impress him with advertising.

A great many have already benevolently ridiculed the supposed dependency of Brazilian architecture on European prototypes. They see only the pretty patterns and overlook the many innovations and inventions. It is in a comparison of the state of things between the two neighbor countries, the United States of America and the United States of Brazil, that one uncovers the true significance of this exhibition. A simple parallel drawn between the most recent and most representative buildings of these countries answers the argument best: There stands the Ministry building in Rio, and here we have the Pentagon building in Washington; in the public eye each of them stands for its country's architectural ideals and aims.

For the South American there exists a riddle in the fact that the government of the United States mobilizes all its capacities to fight the demolishing forces of a barbaric enemy, while in one of its peaceful manifestations, Federal architecture, it is unconsciously an acknowledged admirer and imitator of these forces. Whether the American architect has tacitly supported this tendency—and judging by the professional literature available everything points to this—or whether he was impotent to fight the evil spirit, is irrelevant.

The focus of interest in the Brazilian show, the Ministry of Education building, might furnish the future historian all the material he needs for a study of contemporary achievements in architecture. The photographs, brilliant as they are, cannot convey the inherent gaiety of that construction. Least of all does one perceive the important polychromy which gives to the architecture its unbelievable lightness. An entire world separates it from the colorful gloominess of dirt-incrusted brick buildings or corroded stone houses of the old and new continents. Here the color is *not* derived from the use of material. It is painted on—in a way comparable to the disarming *naiveté* of Greek temples which, as we remember, in their better days hid their marble structure under gaudily-painted stucco. Only we latecomers have been privileged to derive aesthetic pleasure from their bleached skeletons.

No legislation or philanthropic activities can ever compensate for the lack of warm climate. Brazil, through her happy geographical position, derives from it a world of benefit. Livelihood and shelter being within the reach of everybody—sometimes obtained at a wink, so to speak—the atmosphere of the country is infinitely far removed from the ruthless fight for survival. Of leisure there is plenty, and to the Latin it is the accepted basis for creativeness. A certain lack of concern about life's unpleasant aspects favors independence of mind. Under normal circumstances these factors are to be found in most Latin countries; in Brazil of today they exist to a major extent.

Warmer countries favor a simple life, a fact which gave birth to the mistaken idea that they necessarily have a low standard of living. We have examples which point to the contrary. It is indisputable that low cost of labor and cheapness of material invite experimentation and make it part of every activity. In the building field it certainly is the greatest incentive to the architect.

Is there such a strongly-marked dissimilarity between the North American and the Latin as to be noticeable in the architectural field?

Let us choose a very concrete example for demonstration: The stubborn adherence of the English-speaking countries to the medieval system of weights and measures. To the student of American life this is one of the most revealing chapters.

The decimal system is a typical achievement of the Latin genius. The story of how seemingly-insurmountable obstacles arose when its introduction was attempted in this country makes profitable reading. Indirectly it is a study of the difference between American and Latin temperament.

South American countries began to adopt the metric system as far back as 1848. In North America the battle for the introduction of the decimal system was opened by Washington in his first three addresses before Congress. Humanistic ideals and humanistic education were highly appreciated then. Jefferson, the system's most fervent advocate, came close to victory but was finally defeated. In 1910, when the last controversy flared up weakly, a census showed that "only 139,298 people were engaged in science and engineering, and 285,108 in medicine and pharmacy, altogether less than one half million out of about 38 million productive workers, or slightly one percent of the whole." That settled the issue. North America had become a businessman's world.

How did the man of science react to it? I quote a colleague, Mr. Charles H. Tutton, who said in speaking before the Engineer's Society of Western New York in 1902: "The most difficult part of mathematics for students to grasp is decimals, and wherever possible are avoided by business men; and educated gentlemen though you are, it would be perfectly safe to assert that there is not one of you who could not easily be made to stumble over this mode of calculation."

There is an abundant literature concerning the deplorable results in every phase of life brought about by the English or natural system. The amount of money which the country is losing on account of it is staggering. However, the economy of the United States was until recently based on waste rather than on thriftiness. But it is not so much the cumbersome way of calculation which amazes the Latin American and the European as it is the system's unexpected effect on the mental outlook. In architecture, a minor comparison between the work of two outstanding innovators of professedly opposite schools of thought helps to illuminate the point. One example is the limpid conception of Le-Corbusier's Villa Savoie at Poissy, the other one is Frank Lloyd Wright's maze of the hexagonal honeycomb-system house for Dr. Hanna; the first as abstract as thought itself, the latter a reminiscence of the animal kingdom. While Wright's influence on America's architectural youth is evident, Latins would hardly derive benefit from the study of his work.

The initial advantages of the Brazilian architect over his American colleague are many. By his very education and training he is able to get his information first hand and in the shortest way. Studies and practice abroad, which generally cover years and many countries, make him aware of the difference of mentality which is essential for intelligent judgment and freedom from standardized thinking.

Travel is useless if it does not result from a true impulse. Sound curiosity is indispensable for a pioneering spirit. No traveling fellowships can make up for the urge to discover one's own way. Creativeness is not taught in school nor does modern life stimulate imagination. Brazil draws that stimulation from what we call incorrectly the primitive aspects of life. To cite but two examples—in music and painting: Villa Lobos, the composer, and Candido Portinari, the fresco painter. Both are unmistakably identified as products of their own country. Yet their idiom of expression, their style so to say, is frankly cosmopolitan. In Brazilian architecture one finds a wealth of native peculiarities which eloquently dispose of the insinuation that the architects follow a formula imported from abroad. However, forces are at work today which pave the way for standardization which might result in dulling the people's sensitivity. The enormous flow of American magazines and movies will very soon affect the Brazilian's freshness.

Fortunately, Latins are curiously immune to salesmanship. They have kept intact, to an astonishing degree, their capacity for judgment. The fact that they are linguists may in part account for it. It is not uncommon to find among the younger Brazilians some who excel in half a dozen languages. With this capacity they are singularly well-equipped to look into the souls of the people of other countries. Their advantage becomes apparent when we consider the attitude of the North American. In his best-selling book, "Meet the South American", the author, Carl Crow, speaks for his fellow men when he tries to justify his own unwillingness to learn foreign languages. I quote: "I have always felt that by compelling other people to learn English I was making a greater cultural contribution to the world at large." The same author also talks jocularly of the Brazilian's love for study and his astonishing accomplishments, which in his own country would arouse the suspicion of his fellow men, or as he puts it, would be sufficient to doom a political candidate to defeat. More recently, similar outbursts of involuntary frankness were drastically curbed by censorship, and America nowadays takes the utmost pains to present to its neighbors a more flattering picture of itself.

The Architecture of the Future
by Talbot F. Hamlin

Part 2—Techniques, Materials, and Design

The increasing mechanization of the building industry is no longer a possibility—it is a fact. War conditions, with their implacable demands for speed and economy in materials and man power, have forced this development with hothouse rapidity. Prefabricated houses, which were but a short time ago merely exceptional and not-too-successful experiments, are now rising by tens of thousands in war housing developments. All architectural design of the future must be affected by this trend.

Yet, in looking forward to postwar conditions, it would be a fatal error merely to project into the future the types and achievements of today. One extraordinary difference between conditions under war and conditions after the war must be foreseen. Now, everything is done to save materials, and the materials available for use are strictly limited by war needs. Man power is both scarce and expensive. We are, in other words, seeing the evolution of what is essentially a building economics of scarcity—not scarcity of money, but the more important scarcities of materials and labor. Tomorrow, on the other hand, our productive potentialities in manufactured materials will have to be swung to peace-time uses, with a planned speed, if we wish to avoid major economic disaster. Man power, clamoring for employment, will perhaps suddenly be excessive rather than insufficient. The results of these two changes must profoundly affect buildings. The pressure of man power, if thoughtlessly directed, will prove a strong incentive to conversion in building techniques, and will attempt to return the building industry to a condition of individual craftsmanship. One of the chief tests of the leadership of labor groups as well as of capital will be the answer to the question whether selfish backwardness will produce a return to the wasteful past, or forceful and imaginative thinking will enable a following of the road of increased production and increased distribution of good shelter, through the use of every possible economy of modern industrialized construction.

Thus one of the principal questions which will determine the design of the postwar world is essentially a political one, the answer to which is not yet clear. Of this I expect to say more in my third article.

In order to appreciate the potentialities of industralized construction, I am going to assume, for the purposes of this article, that the answer to this question will be made along forward-looking lines—along the lines of acceptance of our enormously-increased productive possibilities as the basic factor in building. At once certain major elements and categories of materials and methods appear as controlling forces. These, with some of the possibilities inherent in them, as I see them, are given below.

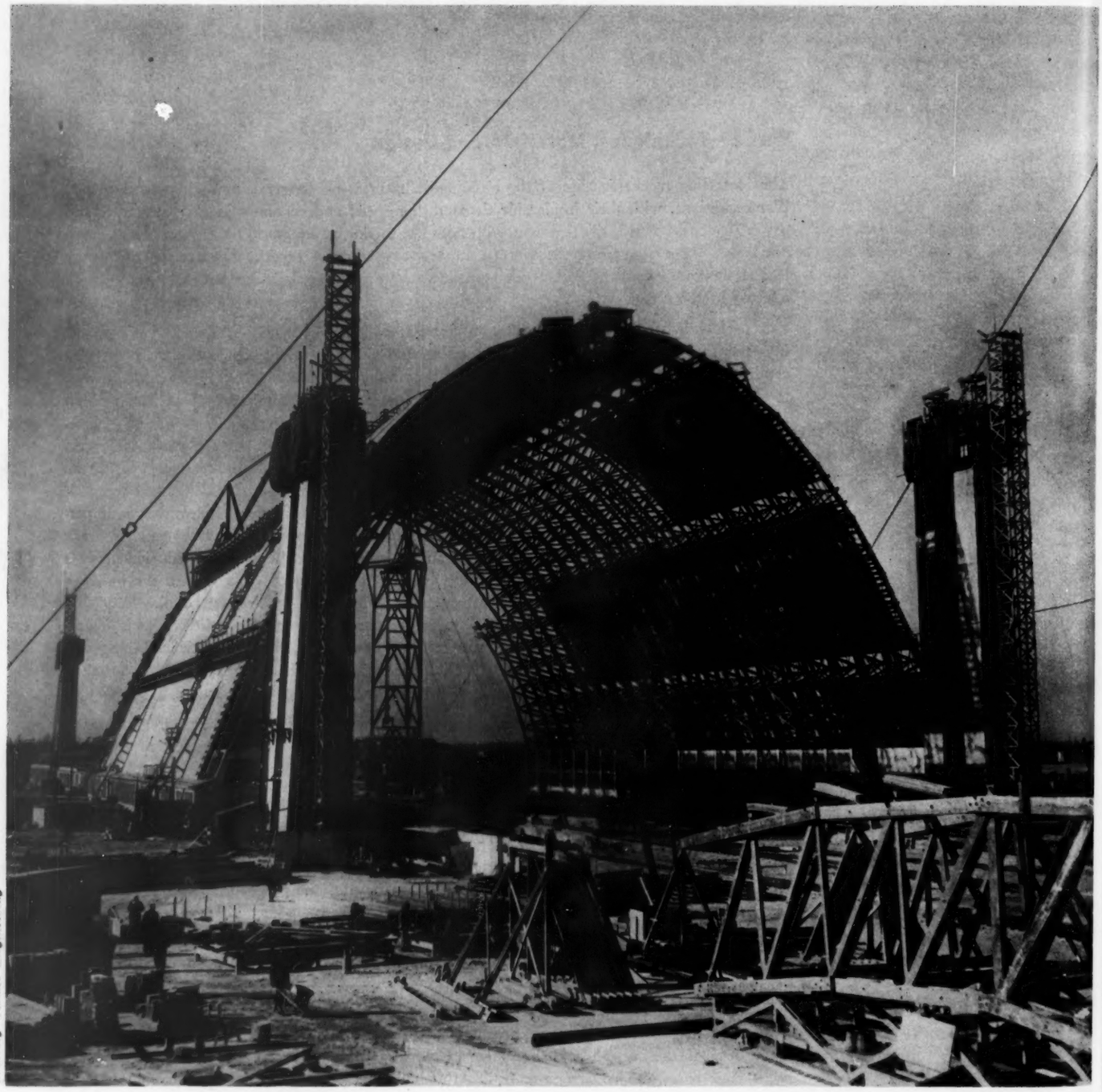
I. *Modular Construction.* This essential element in mass production, a natural result of the doctrine of replaceable parts which is at the foundation of modern industry, controls the whole problem of prefabrication of parts and wholes of buildings. Let us remember that much that goes today under the name of prefabrication consists merely of site assembly, in a horizontal position, of frames or walls; these are then raised and fastened. In other words, it is merely going back to the framed, wood-building technique of the seventeenth and eighteenth centuries, with their barn-raisings. A more fruitful method, that of actual factory production of wall panels or whole walls—or, as in the TVA demountable houses, of entire sections of houses—is quite a different thing.

Essentially, in this factory production, repetition of units is a major source of economy. The more repetition there is, within bounds, the greater the economy. And inherent in the very nature of repetition is the idea that buildings should be composed of repeated dimensions or modules.

There is nothing terrifying for the future of architecture in this development. The endless duplication of stupid shacks which characterizes many recent war housing projects is not due to the technique but simply to unimaginative planning. Let us remember that the same methods of construction have produced Wurster's interesting Carquinez Heights houses at Vallejo, California, just as definitely as they have produced the gabled houses used near Baltimore, and that the pleasant horizontality and openness of the TVA demountables may be considered just as characteristic of industrialized production as the unfortunately more usual Colonialesque shacks of many Southern projects.

After the war, if we are to spread the advantages of the economy of prefabrication, I believe it must come through a greater stress on the prefabrication of typical panel systems, the combina-

War produces a structure in which comparatively new design techniques are carried to logical limits: This world's greatest timber structure, a U. S. Naval blimp hangar, has arches with a clear span which rise 153 ft., provide a 237 ft. unobstructed opening. Overall length is 1,000 ft. Arches are built up from shorter lengths of timber with connectors.



Courtesy Timber Engineering

tion of which may well be left to individual architects or to project designers. In this way the widest freedom may be preserved, because essentially the panel system is enormously flexible.

In order to produce this desired effect, two things will be necessary: first, some kind of generalized solution of the joint problem, which has seemed the curse of most panel systems up to now; and, second, a general agreement on the part of manufacturers with regard to a standard panel dimension, perhaps somewhere in the neighborhood of 3′-8″ or 4′ in width. If an architect designs with a module dimension for which, because of general acceptance of the standard on the part of many manufacturers, he can order furniture, closet elements, and built-in gadgets of all kinds with perfect confidence that they will fit, the freedoms he will gain in design and the practical advantages which will ensue will be tremendous. Even economically such an acceptance would, I believe, be a great advantage to the building industry. Who has not suffered over slight differences in the dimensions of steel sash from different makers, or the different roughing standards of separate plumbing fixture makers? The competitive position of manufacturers would really be improved by agreement on such simple matters—as, for instance, the brick industry was undoubtedly vastly helped by standardizations on the approximate size of bricks.

Esthetically, architecture might stand to gain greatly from the discipline resulting from the use of modular dimensions and panel systems of construction. There would be inevitably a kind of rhythmical continuity in design. There would probably be a further emphasis on horizontal serenity and a kind of quietness in effect, resulting from repetitions of certain units within a variety of compositions. It is noteworthy that in the past some of the greatest monuments of architecture, like the Parthenon, have been achieved through the gradual study and refinement of perfectly-accepted general forms—like the orders of architecture, or the continual development of almost standard dimensions for the pointed arch bay in French Gothic work. Something of the same type might conceivably follow from the disciplines of modular design caused by industrial development.

II. *Laminated Wood and Plywood Construction.* Even before the war the development of plywoods, of laminated constructions, and of new types of plastic glues was going on apace. War industry, particularly in connection with airplanes, has vastly increased this development, and after the war it is likely that through the combined use of wood and plastic we may be in command of construction of great strength, lightness, and delicacy of appearance, which at the same time may be practically fireproof.

We know now that we can build up structural members of separate small pieces of wood, either as continuous rectangular members, as arches, or as I-beams, which are easy to work, and, in proportion to their weight, are among the strongest of building materials. Already they have done much to liberate American architecture from the rule of the T-square and triangle, and, although their use has been reserved largely for industrial buildings, one sees at once infinite possibilities for light and soaring interiors in churches, for beautiful curved roofs over theaters and auditoria through the use of laminated arches or braced frames. One foresees interiors in which the structural members are boldly expressed with a new lightness and delicacy, perhaps emphasized by polychromy. Even in houses we may find daring designers using high roofs for living room or studio or social hall, in which there may be the same inspiring use of curves in section. These roofs, in combination with skylights or monitors, can be seen as creating perhaps an entirely new type of well-lighted interior space.

Plywood with its perfect surfaces, finished either in a transparent finish to reveal the beauty of the grain, or painted, will bring new freedom of color and perhaps also a new harmony between furniture and wall. Because less subject to denting than thin metal, and less fragile of surface than many wallboards of the past, it will offer unlimited opportunities for imaginative interior and exterior use. But one qualification must be remembered—the high sound-transmission factor. Plywood construction will necessitate a greater study of insulation materials and their simple application. We may possibly have interior partition panels, factory-constructed to the accepted module dimensions, in which such insulation is already included.

In the field of construction we may also look forward to a development of pre-stressed framed construction in light wood, where the clever combination of curved members may bring into building interiors something of the light and tense delicacy of a yacht cabin. And especially we shall probably have a great development of all sorts of stressed-skin constructions in order to achieve for buildings something of the economy and lightness of material which airplanes have already acquired. The United States Forest Products Laboratory had already been making the most advanced studies along these lines before the war, and it is in this type of construction that I believe much future prefabrication will win its greatest successes.

III. *Plastics.* That group of chemical synthetic materials which, somewhat infelicitously, has been termed plastics has already achieved such common industrial use that the term has become almost a byword. The extension of plastics manufacture from the making of mere gadgets to the construction of larger elements of building is not difficult to foresee, and the opportunities for the employment of such materials seem almost unlimited. We can obtain plastics transparent, translucent, or opaque. We can get them in almost any color, and with any finish we desire. Through die-casting, almost complete flexibility of shape is possible but the expense of die-casting in large units will probably limit building uses to certain common and well-accepted elements, where the economies of mass distribution hold true. The use of plastics, however, must be in accordance with their qualities, and we must realize that many types have surfaces that are easily abraded and scratched, and that by their very nature refinishing is impossible. Yet, where large areas of clear color and a perfect surface are required—where transparent sheets more flexible, lighter, and more elastic than ordinary glass are desirable—there plastics offer almost unlimited opportunities in the architecture of the future.

The construction possibilities of plastic glues have already been touched upon in connection with laminated and plywood materials. May we not look further into the future perhaps and foresee reinforced, transparent, plastic slabs as structural members, in which the reinforcement itself, of wood or wires or other materials, becomes a decorative language emphasizing the structure? But let us at all costs avoid one of the besetting sins of present-day plastic industrial design, the use of the material to imitate other materials—the burying within it of wood to

make it look like wood, or of textiles to make it look like some kind of super-starched cloth. Its own possible beauties are much too great to waste on these silly semi-imitations.

IV. *Glass.* One of the greatest movements in the peace-time architecture of America, in the years immediately preceding the war, was an enormous increase in the use of glass. In this movement two purposes seemed to be at work. One was a growing love of the connection of outdoors and in, a real expression of some popular movement toward an increasing touch with nature, and also a kind of almost mystical feeling for space and its geometric subdivisions through the feeling of *beyondness* that transparent glass makes possible. The other was a rather childish and basically illogical delight in the magic of a material which is both there and not there.

For the first of these two aims I see only an increasing power. We shall more and more tend to realize that the old concept "window" is not one thing but many different kinds of things. We shall tend to see that view and the sense of connection with the outdoors are one thing, and that ventilation and perhaps egress are entirely different things, and we shall design accordingly. We shall realize that even the question of light has many facets, and that every daylight source should be examined as to whether diffused or direct light is wanted, and make our choices accordingly as between clear glass, diffusing glass, or glass block.

On the other hand, I hope the mere childish delight in the magic quality of glass, which has stretched acres of unnecessary panes over many buildings, only later to cover them with curtains expensive to make and to maintain, is on the decline. Glare may frequently be as unpleasant as darkness, and the feeling of shelter is one still dear to many human hearts; it is not a feeling merely *old hat* or even anti-social. A certain amount of privacy is, in a way, a kind of correlate of democracy, and the architecture of the future should bring a much more careful study of actual human needs, and with it a correspondingly greater care in the use of glass.

Yet glass has other possibilities than those inherent in the old-fashioned window or glazed door. Glass of new qualities of flexibility, of opaqueness, and of heat insulation is continually being made, and research into the possible qualities obtainable in glass is still far from complete. The possible developments of glass for wall panels, for exterior wall surfacing, and for pavements or translucent ceilings have scarcely been tapped. One thinks of the Pavillon de Saint-Gobain at the Paris Exposition in 1937 as containing many foretastes of the future in the exquisiteness of its use of mirror, of transparent and translucent walls, ceilings, and floors, of mosaic, and of surfacing as indicating some of the inspiring possibilities for the architect in the future developments and growing cheapness of this magnificent material.

V. *Metals.* The war has temporarily taken almost all metal construction away from the architect at the very moment when the actual production of metals was reaching new highs, and when research had given us, and is continuing to give us constantly, new types of new and light-weight alloys designed for specific purposes. When the war ends, these will suddenly again become available for building use, and it is exciting to speculate on the possibilities. One thing I believe we may be sure of—that certain types of metal construction, certain ideas of skeleton-framed building, will achieve a new lease of life due to the cheapness and strength of new alloys. Moreover, great advances in large-scale metal fabrication and assembly in connection with both planes and artillery might very well serve to make available at reasonable cost all sorts of shapes in addition to the standard rolled sections. This, in conjunction with an almost certain increase in welding instead of riveting, will enormously increase the freedom of the architect in producing designs which are founded on both structural efficiency and the desire for expressive effect, and, where circumstances make it unnecessary to fireproof the frame, will undoubtedly produce many interiors—perhaps mostly for industrial purposes—immensely "cleaner", simpler, and more delicate than anything we have known.

This development will be accompanied by a further increase in the use of what the engineers call indeterminate structures—a movement already well under way before the war—and will therefore bring to the fore those designers who think intuitively and naturally in terms of structural forms; no longer will a handbook be the complete answer to all structural problems.

But framing metal is only a small part of the architectural use of metals which the future will bring. One may confidently expect, I believe, a large increase in metal-framed windows and doors of all kinds, arranged for weatherproofness, ease of operation, and ease of screening or curtaining. These will have a grace of line and a perfection of detail which will make the stock metal sash of the past seem the rather crude expedients they are.

Sheet-metal elements will also come into use for many different purposes, from wall panels and wainscots to uses purely decorative. Here, however, one must not be too sanguine, or attempt to use thin sheets for purposes for which they are obviously unfitted. It is still impossible to make a silk purse out of a sow's ear, and architects and manufacturers alike must learn that wall panels—whether outside or in, whether left in some natural finish or enameled—must be of a sufficiently heavy gauge not to warp or wave, nor to be dented by the ordinary usage

they receive. One thing in the past which has given metal-panel construction a bad name is precisely this mistake. Nothing is more cheap-looking, more frowzy, than a wavy, bent, or dented panel, where a clear, pure surface should be found.

Esthetically, the different colors and different reflecting qualities obtainable from various metals and alloys, combined with the thin strength that the material suggests, offer endless opportunities. The Metals Building at the Paris Exposition of 1937 was full of suggestions of possible future treatments. Its combinations of sheet and structural metal, its contrast of shiny and mat-finished elements, and its beautiful harmonies of copper, brass, and silver colors were full of inspiration. Perhaps in metals less than in any other material had American designers realized the vast esthetic potentialities of the elements with which they dealt.

VI. *Masonry Materials.* In masonry there has been perhaps less change, less advance, for humanity has been working longer with masonry materials than with metals, say, or glass. Yet the avenues of possible change are by no means closed. We might, for instance, foresee new types of light-weight structural glazed terra cotta, perhaps obtainable in large sizes, which might form excellent materials for outside screen walls. We might foresee a new development of large-size bricks or brick-type tiles, and a new availability of glazed brick of various kinds. In brickwork the pre-war architecture of Holland was far ahead of our own, and much of the beauty in many Dutch works of Dudok or of Brinkman and Vander Vlugt came from the use of glazed or hard-burned light bricks, laid up with light joints in planes of meticulous precision.

It is in concrete that the greatest changes have occurred in American practice, for here the war-time necessities of many large structures, of conserving reinforcing steel, and of producing rapidity of construction have forced the use of many new types of concrete design. It is noteworthy that many of these types have been based on the arch or variations of the arch, and here again the tendency toward curved lines in architecture can most easily be seen. We find, for example, that American engineers are beginning to use thin-shelled vault types in industrial work, and superb arches of great scale as in some of the recent Navy hangars. All of these changes mean a new flexibility in the use of the material, and a new interest in the effects which it produces; they give to many interiors the lift and swing which the best concrete bridges have for a long time possessed, but which were lacking in the more "architectural" structures.

This movement, together with additional perfection of surface gained through mechanical vibration of the concrete, the use of plastic or plywood or metal forms, will be bound, I believe, largely to influence the appearance of much of our postwar building and may eventually give, particularly to our industrial areas, an interest and vividness, a dynamic quality, which thus far they have too often lacked.

All of these changes in materials and techniques have one thing in common—flexibility. All lead not to stultifying standardization of design, but to a new freedom in form creation. Many suggest a new efflorescence of curved lines in architecture, which may profoundly change the appearance of our buildings.

All, in addition, make new demands upon the architect. No longer can he be the mere decorative designer whose dreams are then built by an ingenious engineer; for in every case these changes, whether through fabrication or the new types of indeterminate engineering structure, integrate relentlessly the design of buildings and the way they are built. The architect of the future, therefore, must have a new sense of structural integrity; he must learn to feel structure, to think in forms appropriate to it, just as the engineer must learn to be less dependent on his handbook and more ready to collaborate in the creation of new shapes.

The danger of the future is that architecture and architects will be swamped under the flood of new and untried materials. The commercial pressure, after the war, toward selling these new things for buildings will be tremendous. If we may judge by the past, not all of these materials will be suitable for the purposes for which they are sold, nor will all the methods be efficient or yield weatherproof or permanent results. How is the architect to judge? To whom is he to turn for unbiased opinion? For he cannot himself test all the materials that will be brought to his attention, nor can he in conscience foist them untried and untested on an unsuspecting client. His dilemma is very real. He must take advantage of these war-time advances, yet at the same time he must protect his client and his own reputation.

This would seem to me to make almost superlatively necessary the erection by the American Institute of Architects, or by the government or some other unbiased, disinterested group, of a building research institute where experiments can be carried on and their results reported honestly. We need increasingly in architecture the kind of thing which the American Medical Association does for its members in reporting on new drugs and in making public through its JOURNAL the results of clinical experiments. Only with the aid of such a body—governmental or professional—and operating on a much more open and less timid basis than the present Bureau of Standards—will the architect be able to fulfill the great responsibilities for making buildings available to people which the future will bring to him.

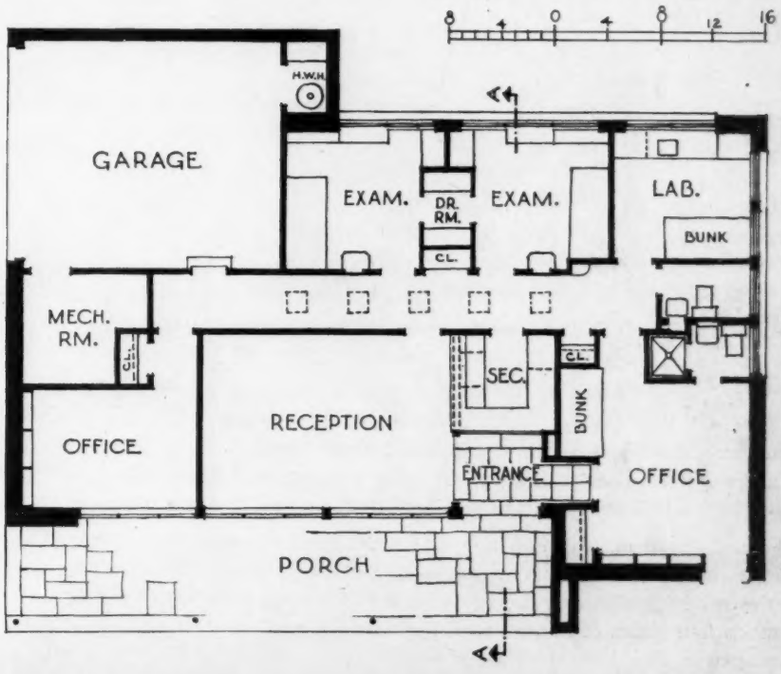
Morris Clinic, Austin, Texas

Bubi Jessen, Charles Millhouse, Wolf Jessen, Richard Kuhlman, Associated Architects

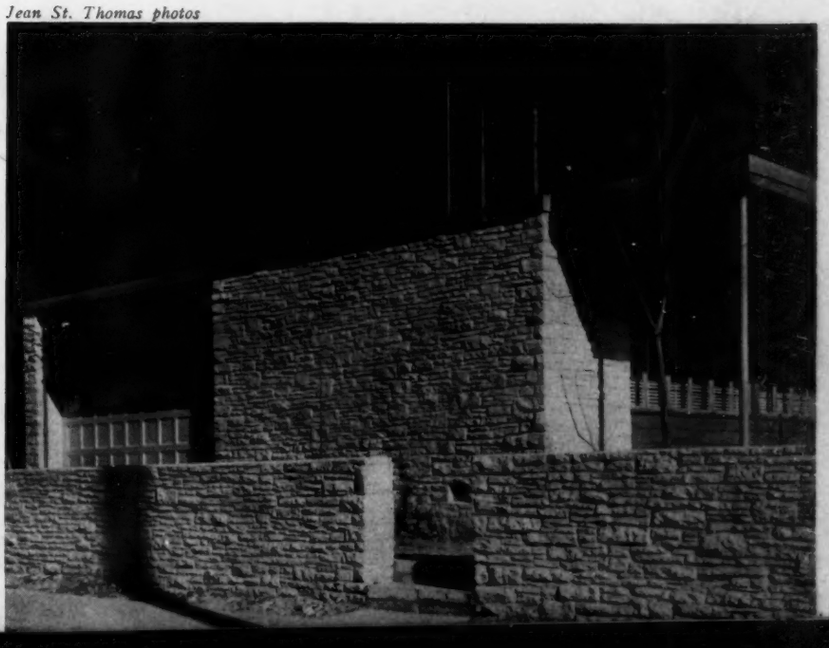
The building was designed for the use of a doctor and his associate in obstetrical practice. Situated in a residential section, on a minimum site, particular attention was required to adapt the use requirements to the site and the surroundings. The client desired a building that his patients could use with convenience and one that fitted the special needs of his practice. Two offices are provided for the doctors; one has space for a library, a bath, and a bunk for resting at off times, as well as general office space for consultation. The nurse's office has a reception desk and case file space, a business desk for keeping accounts, typewriter desk, and supply cabinet. Above this cabinet is placed a standard patients' card file cabinet. The remainder of the top is used for a typewriter and work table for preparing case records, Under the front counter is the office supply cabinet. Two sheets of sliding plate glass separate the room from the entrance lobby. The reception room is completely separated from the remainder of the building and is controlled from the nurse's office.

The examining rooms were developed around the equipment and use of the rooms. As only one side and one end of the examining tables was required to be left free, the rooms could be kept to a minimum of space. A removable glass shelf is provided for instruments in use and a glass cabinet for sterilized instruments with a linen cabinet below. These linen cabinets are stocked from the linen closet in the hall. A small desk is built into each room for use in writing case records while the examination is being done.

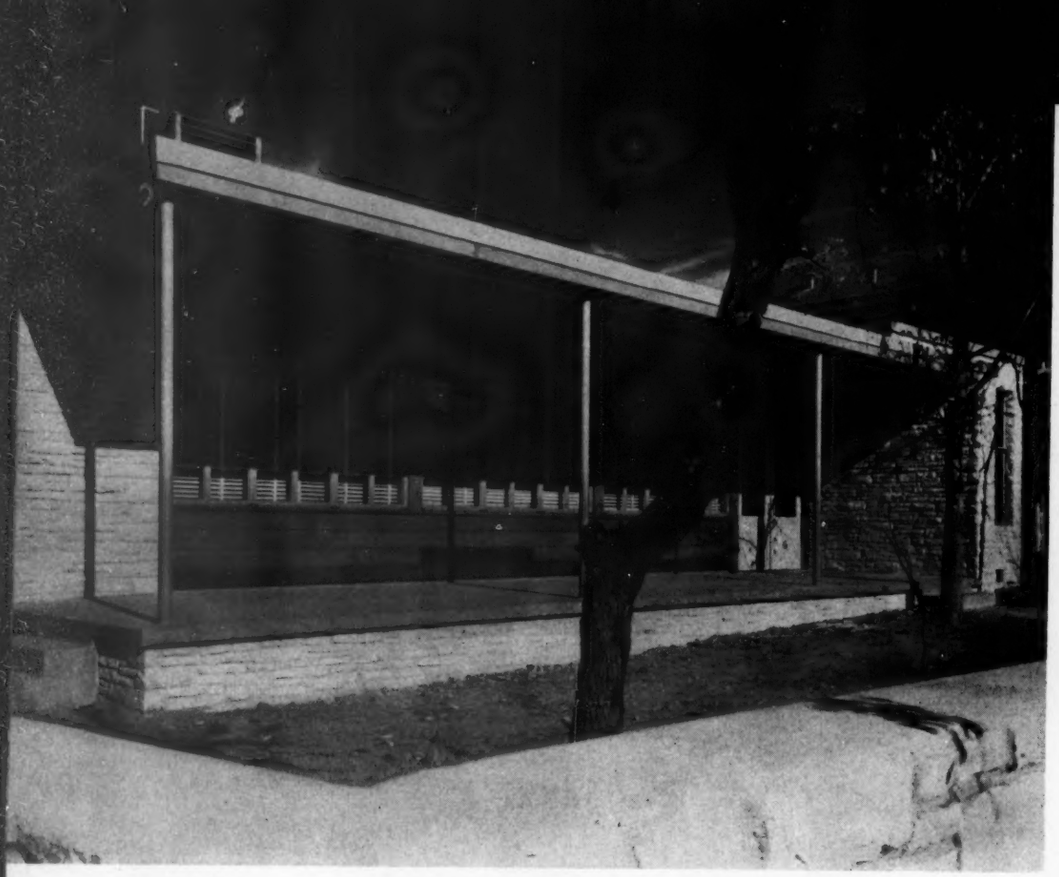
The laboratory contains facilities for storing medicines and serums at normal and low temperatures as well as facilities for general laboratory work. A built-in couch is provided for the use of the patient while tests are being made.

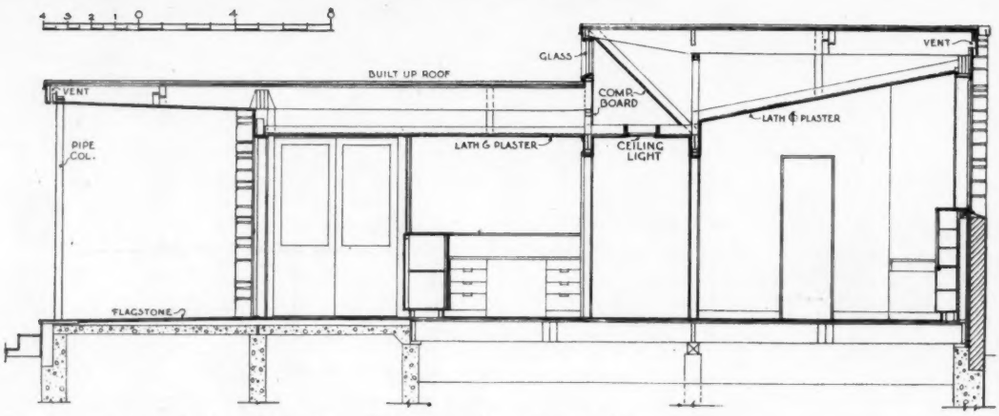


Jean St. Thomas photos



The building is of stone veneer on wood frame, with a reinforced concrete foundation. Texas ledge limestone, quarried in the vicinity, was laid up in its natural bed. Trim and siding are natural-finish redwood.

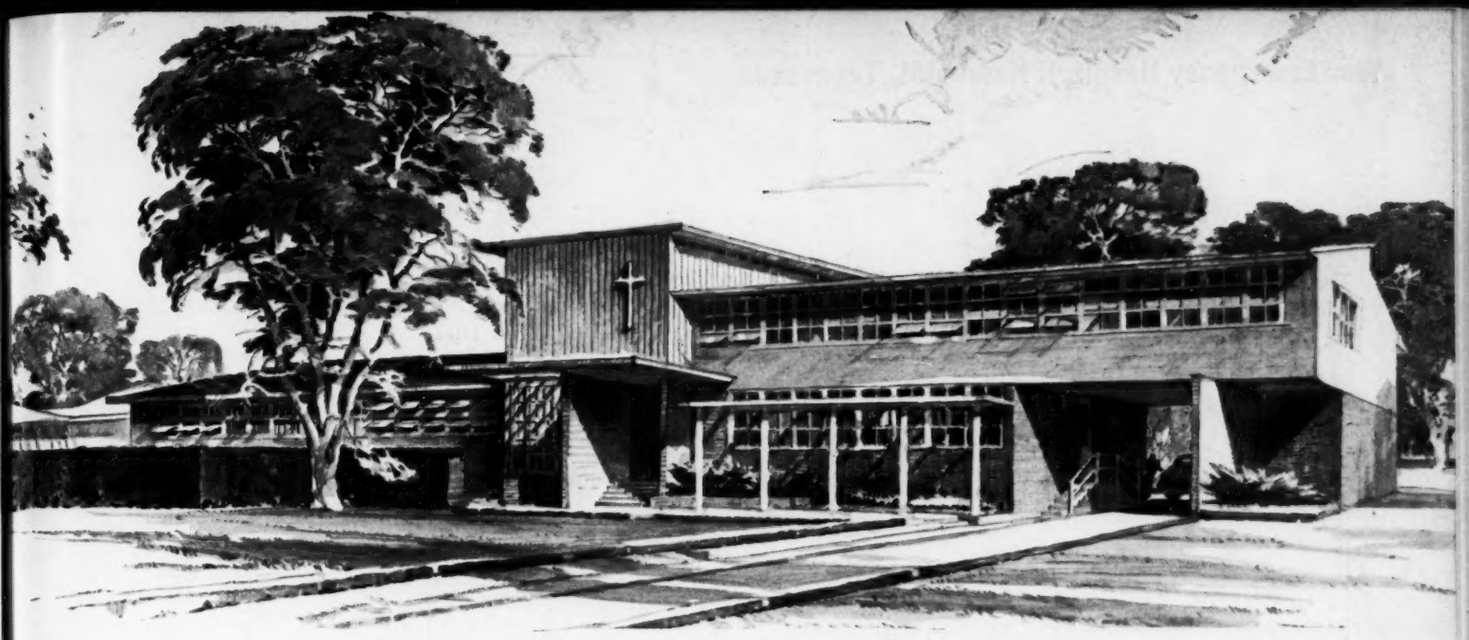




The mechanical room contains equipment for year-round air conditioning. The garage is equipped with a motor-operated door to facilitate the many entrances and exits required during the day. An intercommunicating telephone system was provided between offices, examining rooms, laboratory, reception desk.

The roofing system, with clerestory, was designed to provide borrowed light to the inner hall, and space for air conditioning ducts, as well as to furnish adequate north windows at the proper height above grade in the examining rooms. A sloping ceiling provides better natural lighting in these rooms. The ceiling contains four inches of mineral wool insulation. Roof is of the "twenty-year" tar and gravel type; flashings, gutters, and downspouts are of copper.

Frank use of the cooling tower of the air conditioning system as an architectural element is noteworthy.



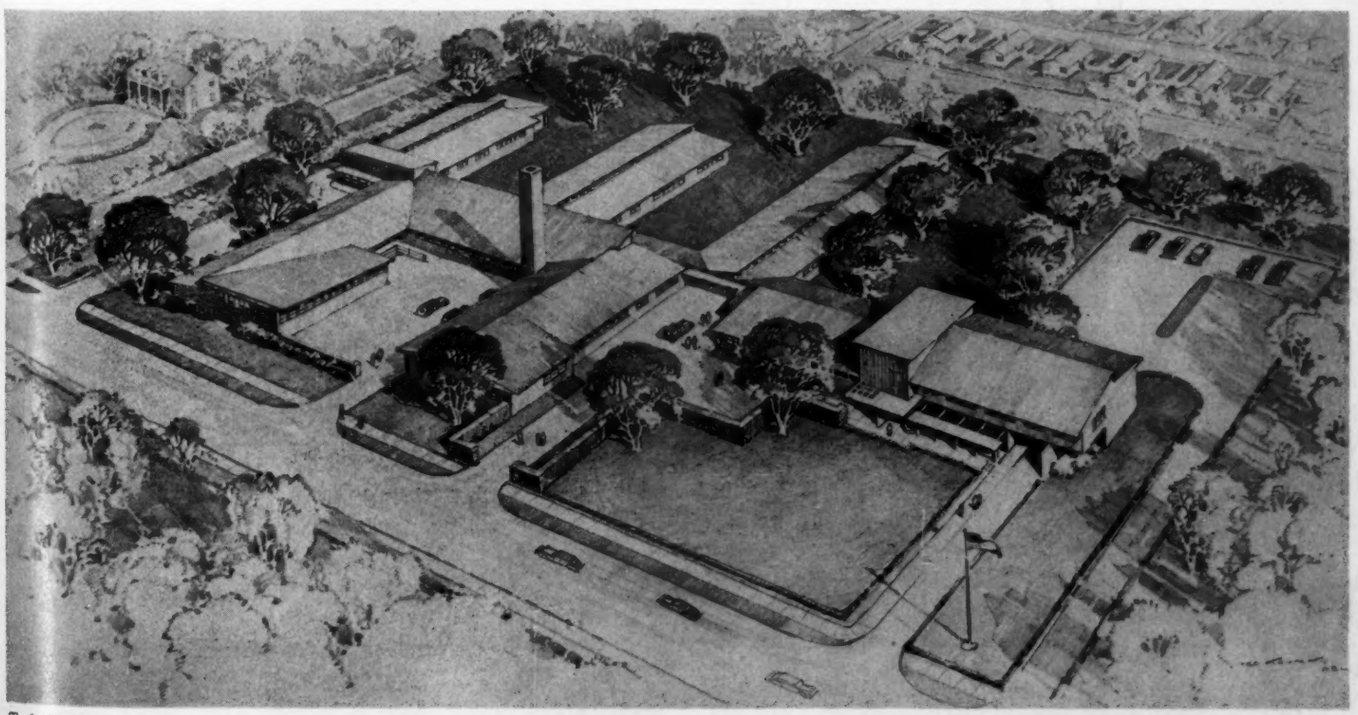
War Emergency Hospital, Humboldt, Tennessee

Dent & Aydelott, Architects

Now under construction in Tennessee, this hospital is financed with Government funds; planning and construction are supervised jointly by FWA and the Public Health Agency. Marshall Shaffer, Architect, is supervising design for PHA. The hospital is to be operated by the Sisters of Notre Dame, and will serve the great numbers of war plant workers who have flooded the region. This will help to relieve pressure on a city which already served surrounding rural communities.

Humboldt War Emergency Hospital, a 50-bed institution with outpatient, maternity, surgical, medical, X-ray, and emergency facilities, was designed on the basis of an exhaustive survey made by FWA and PHA. The one-floor pavilion plan (except for the Sisters' quarters) was adopted to eliminate the fire hazards and the necessity for ramps, stairs, and elevators inherent in multi-story buildings—a decision which is credited with saving critical steel. For similar reasons, construction is of masonry generally, with windows set tightly under the eaves, obviating the need for lintels. The roof is wood-framed, and is ventilated (an important consideration in the South) by means of louvers. Ceilings are insulated.

Of the design, the architects say: "Careful planning, with special regard for the dependent relationships of the various parts of the building and the use of materials in the most honest manner, makes an interesting affair of the type of project that has been abused since the advent of the priorities system. Too many of the hutment type of buildings have been given up for lost at the outset and treated in Army Camp fashion, with the result that most of us hope they are truly emergency appointments and that they will be done away with when they cease to serve their war purpose." (Plans on following pages.)



Ted Kautzky, Del.

War Emergency Hospital, Humboldt, Tennessee

The building is so oriented that patients' rooms have east and west exposures; other areas have north light. Each of the principal functions forms a separate unit or pavilion, connected to the others by a corridor. Distribution of segregated nursing space for Negro and white patients, required by law, was determined by the population ratio.

UNIT A
1, Emergency Room
2, Emergency Utility
3, Bathroom
4, Stretcher Storage
5, Pharmacy
6, Superintendent of Nurses
7, Admitting Office
8, Information and Telephone
9, Waiting Space
10, Business Office
11, Secretarial Office
12, Sister Superior's Office
13, Staff Room
14, Record Room
15, Outpatient's Waiting
16, Outpatient's Dept. Office
17, Treatment Room
18, Examination and Treatment.

UNIT B
1, Laundry
2, Soiled Linen
3, Clean Linen
4, General Storage
5, Male Help's Lockers
6, Female Help's Lockers
7, Nurses' Toilets
8, Nurses' Lounge
9, Staff D.R.
10, Help's D.R.
11, Kitchen
11a, Can Washing
11b, Garbage Refrigerator
11c, Refrigerators
11d, Day Storage
11e, Diet Kitchen
11f, Formula Prep.
11g, Dishwashing
11h, Meat Preparation
12, Boiler and Fuel Room
13, Laboratory
14, Doctors' Dressing Room
15, Nurses' Dressing Room
16, Minor Surgery
17, Scrub-up
18, Major Surgery
19, Clean-up Room
20, Anesthesia Storage
21, Central Sterilization
22, X-ray Room
23, X-ray Dark Room
24, X-ray Waiting and Dressing
25, X-ray Viewing
26, Physiotherapy
27, Morgue and Autopsy
28, Housekeeper

UNIT C1
1, Pantry
2, Stretcher Storage
3, Patients' Storage
4, Four-Bed Ward
5, Janitor's Closets, Toilet, Bath
6, Two-Bed Ward
7, Single Room
8, Isolation Room
9, Isolation Utility
10, Nurses Station
11, Utility, Dirty
12, Utility, Clean

UNIT C2
1, Pantry
2, Stretcher Storage
3, Patients' Storage
4, Four-Bed Ward
5, Toilets, Bath, Janitor's Closet
6, Two-Bed Wards
7, Isolation Room
8, Isolation Utility
9, Nurses' Station
10, Utility, Dirty
11, Utility, Clean
12, Nursery
13, Work Space
14, Suspect Nursery
15, Doctors Overnight and Lockers
16, Storage
17, Labor Room
18, Sub-Utility
19, Scrub-up
20, Delivery
21, Clean-up Room

SECOND FLOOR
1, Chapel
2, Sister's Room
3, Bath
4, Community Room

Discussions on Urbanism

The Planning and Housing Division of the School of Architecture at Columbia University has established a study group, composed largely of architects, which is meeting weekly for sixteen weeks to hear the views of engineers, lawyers, economists, sociologists, public administrators, etc. on the problems of urban rehabilitation and to participate in discussions rising out of the questions developed. NEW PENCIL POINTS *is publishing monthly reports of the discussions and procedure, of which the following is the second installment. The first appeared last month.*

4 Urban Economics and Land Values, by Edwin H. Spengler, Ph. D., Associate Professor of Economics, Brooklyn College; NRPB Consultant; author of books on taxation, urban land values, and related problems.

Just this past week I read Cleveland Rodgers' new book, "New York Plans for the Future." He calls Chapter 14: "Babies and Real Estate Values." This might furnish an interesting tie-up with last week's discussion, when you were talking about individual behavior, the human element in society, and reactions of people. He refers to the fact that women are very anxious that their babies be brought up in the right atmosphere, the right climate, and the right environment; and that cities must have all of those things. Lacking them, it loses its appeal and people move out. This is followed by a decline in values. There is a close relationship between the number of the people who live and work in a city and the level of land values in that city.

When we sketch the history of American urban growth we discover that the fantastic values in some of our cities today are of relatively recent origin. There is nothing intrinsic about them. We know that in Manhattan, for example, many property values reached a very high point in 1928 or 1929. Land was worth hundreds of thousands, and millions of dollars, in areas whose value had been as little as $15, $20, or $25 an acre not so long ago.

Let us briefly examine development of cities in order to understand the rise in values that has gone along with their growth. One hundred years ago only one city in the United States had a population of as much as 250,000. That was New York, where the population was slightly over 400,000. Almost 90% of our population at that time lived in rural districts; that is, in towns of less than 2,500. Within this one hundred years there has been a tremendous increase in the size and number of our cities. By 1880, only 40 years later, there were four cities with a population of from 250,000 to 500,000, three with a population of from 500,000 to 1,000,000, and one city with more than a million; that was, again, New York. Today the majority, 56½% of our population, are city dwellers. In the ten largest cities in the United States we have 20,000,000 people. We might add that 29%, or almost one third, of our population now live in cities of 100,000 or more; and that represents an area of approximately 5,000 square miles. Our continental territory is, I believe, roughly 3,000,000 square miles.

I mention these data to make you aware of the fact that when we refer to "land values," we must recognize that they exist because many people want to live in the same place. Land values are not intrinsic, but are something that we attach to land because of the way in which we behave when we are all anxious to get the same plot of ground. Competition creates the values that we speak of, i. e., competition of a peculiar sort. It is the main regulative force in the determination of values in the market; but the real estate market is far from perfect.

We normally think of the market, in the older, classical approach to economics, as the place where people trade, where sellers come together with buyers and there is activity on both sides. The real estate market does not have all these qualities. The market is limited. Dealings on the market are not as frequent as those in other commodities, because real estate is usually bought as a long-term investment, and there is no central exchange. They tried to set one up in 1929 but it was not started at the right time and did not get very far.

In general, we would therefore say that the characteristics of real estate are not the same as those of other types of commodities. The market for real estate is not constant, but is subject to a number of erratic traits. The market fluctuates freely from a seller's to a buyer's market. The influences that are at work on the demand side of the market are varied. They include increases in population, increased opportunities for employment, (which again act as a magnet for more increases in population); rising wages and salaries (with the same type of effect); an increase in the marriage or birth rate; a decrease in "doubling up" of people so that they live separately and don't combine households with those of their relatives. All these may be called *positive* tendencies, which lead to increasing requirements for land. On the other side are the negative aspects—declining employment, falling wages, a declining or static population, falling marriage and birth rates, and increased doubling up of people with relatives.

So far we have spoken only of factors affecting the *demand* for land. In terms of supply, there are again many variables. There is the psysiographic factor—i. e., extent or physical quantity of usable land. A second element closely associated with the first is accessibility. Transportation is thus another dimension of area in a city. With increased speed and reduced costs of transportation we have the opportunity of spreading out the area that once composed the city.

The third element of supply relates to zoning, or public land-use control. The city can increase or decrease the economic supply of a given quantity of land by changing the zoning laws. Then there is the further question of the availability of vacant land, which indicates the flexibility of supply. If there is much vacant land, new sites are readily available; if there is little you are hindered; unless you tear down improvements. There is also the subject of skilled labor, or of the adequate supply of skilled labor and material for building and construction. Also there is the further question of financing costs. If you have low financing costs you have a very much more flexible supply in the form of new space that can be made available.

On the negative side we have the reverse of these elements. For example, a city located on a river might lose a part of its land area if the river changed its course. The limitation of transportation, such as the withdrawal of the use of automobiles today, would tend to make the land close in more attractive.

I have mentioned some of these elements of demand and supply only because I want to impress upon you the great number of variables involved. All of them enter into any discussion of land values. And that should impress you with the fact that the value of land is not *in* the land, but it is a *by-product* of all these things. Therefore, if you have an accumulation of negative elements on the side of demand and a great accumulation of positive elements on the side of supply, you are likely to encounter a considerable reduction in the value of land. Conversely, if you have a material increase in demand, and no change, or even a reduction in supply, you would experience a tremendous increase in value of land.

Increases of the latter variety have occurred in a great number of our cities, almost as long as we have been a nation. The reason is that many people have streamed into the cities, looking for available space to carry on their economic functions; and the flow of population has been too heavy for the limited land area. People cannot move fast enough; cannot get space quickly enough. Even where the supply elements have all increased, the relative increases in demand have been more rapid in some areas, resulting in a set increase in demand, and hence higher land values. An example is a city like Boston. In its long history it has had very important changes in the supply of land in almost every one of the directions I have spoken of; psysiographic factors have been changed by the tremendous job of land filling that has increased the area of Boston so that the original sea coast has disappeared and a brand new coast line has been created. Transportation has been improved, new areas of vacant land have been opened, etc.

So far as transportation is concerned all sorts of changes in speed, not only in Boston, but in every one of our cities, have increased the supply of land. At first, people had to be able to walk to work, when they had to rely on their own foot-power to get to places. Then we had the introduction of slow vehicles, then faster vehicles, then rapid transit, the automobile, and now airplanes. As we introduce more rapid means of communication and transportation we extend the usable boundaries of our cities even if we do not acquire new physical areas—which might help to explain the fact that zoning has been changed again and again in our cities as people have come to realize that zoning ordinances no longer satisfied the changing needs of the city.

Another point we find in Cleveland Rodgers' book: He explains that the zoning legislation now in effect in New York is entirely too liberal. If we were actually to follow what zoning ordinances permit we could increase the city's population to 77,000,000, and provide accommodations for all of them in terms of physical space for various uses permitted under the zoning laws.

Land values are, therefore, the result of varying combinations of elements in different periods of time. We cannot rest assured that land values will continue to rise, or even that they will continue to remain stable. It is quite possible they will show a long-term trend of decline, just as we have come to experience a long-term trend of rise.

In discussing land values in residential areas we find the general tendency is for land values to decline unless some more intense use is ultimately made of the land. The reason is that residential areas usually start off on their best foot. Gradually, as they become older, and it is recognized that they are going out-of-date, obsolescence and depreciation creep in and values decrease.

However, when values have declined, it has been the building values which have declined; with more intense use, land values have risen. People have become accustomed to this shift of values from improvements to land, and have developed the viewpoint that everything would come out all right. It has done just that in so many of our cities that we have come to expect this combination of increased land and decreased building values to continue to form a higher total.

We find the problem of analyzing neighborhoods resolves itself into determining which areas are likely to suffer future decline ahead of others. Factors include the location with respect to the main lines of city growth; that is, whether an area happens to lie within a certain sector which is projecting out from the city. If it is, it grows with that sector. If it is not, it may remain stalemated for a long time. Other things to consider are the age of area, its condition, what repairs and improvements it requires, etc. Another thing is how near it is to blighting influences such as undesirable land uses or certain groups of people whose presence in the neighborhood is, directly, a sign that people are going to move out. Then there is the question of income-groups that move in, and the trends in that direction. These lower income-groups are not likely to keep the community in the same state of repair and maintenance as did the higher income-groups, and they in turn will lead to still lower groups in poorer classes of society that take over the territory. The outcome is, of course, a steadily-declining value.

Another sign to look for is built-up spaces and vacant space. At first we find that certain amounts of vacant space are desirable if they allow for considerable flexibility in the community for new uses. Gradually such spaces might appear as threats to the stability of the community because people may not be holding the land for uses that would make for the best development of that section.

However, in some areas there is a definite shortage of vacant land. The community lacks open air spaces and parks; you have a situation like ours on Park Avenue, where we have expensive, high-class apartments that are inadequate as far as children are concerned because they lack the play spaces associated with much lower-priced housing projects. We might add other factors, such as transportation, or availability of schools and churches. All are elements of value. All are extremely important when making an analysis of a neighborhood.

One subject I have not mentioned is that of tax rates and assessments —which, strangely enough, are also a product of all of these things because assessments are supposed to reflect valuation. At the same time they have a powerful effect on land values. The level of taxation frequently affects the market valuation; i. e., the investment worth of property depends to a large extent upon the taxation level.

What is the future trend in land values? What can we say concerning the subject of high density in land values? How does that bear on the future plans of cities?

First of all, let me present the idea that we are rapidly reaching a saturation point in urban growth. If you study the development of our urban areas, you find that the great growth in values was taking place in the period between 1880 when a little less than ten percent of the population lived in cities, and the present, when more than 56 percent live in cities. The trend obviously cannot repeat itself, because we now find that we cannot draw more people from rural areas; the elements of urban population are becoming stabilized. Proof of this is to be seen in the last census reports. In 1930, the population in urban communities was said to be 56.2 percent; in 1940, 56.5 percent—up 0.3 percent in ten years. I venture to say that in 1950 it won't go up any more; it may be less. It will hover around that figure because we need a certain proportion of our population in rural areas. Movement to cities must remain close to its certain level, or at a certain saturation level, once that has been reached. What this means is that shifts of urban population will be *among* cities; but not *to* cities or *from* rural areas. Nor, probably, will they be as rapid as that shift in the last hundred years.

What were some of the elements present in the initial period of development of urban communities? In the first place there was large-scale immigration from abroad. In the second place, there was a tremendous farm-to-city migration, and in the third place there was a strong nuclear growth around strategic urban cities. There was a rapid formation of cities in newly-developed areas. Everyone wanted to cluster as closely as possible to the center of things. Students of land economics are accustomed to drawing a star-shaped diagram to show this growth pattern of cities. People tended to move into cities and settle along the various avenues of transportation leading in to the city's heart, to get a space as close as possible to the center. When it was no longer possible to get anything more in the central area they moved out on the avenues of transportation and tended to cluster in star fashion. Always the least-preferred point was that most distant from the city. This is but an approximation, since cities grow according to geographical location, but the tendency has been toward this kind of growth.

More recently, land economists discovered the *"sector"* theory of growth, i. e., that one end of the city might be preferred to another end, so that one arm of the star went out more than any other part. Sector growth may lead to peculiar combinations; take Syracuse for instance. The New York Central railroad station is the point around which the city grew, but the city grew at first on one side only. Eventually, some areas on the outside edge seemed less desirable than some on the other side of the tracks. Gradually, some of the best places moved across the tracks, and the city grew like that with the railroad running right through the middle. One fine day a traveler looked at it and said, "What a crazy way to build a city!" Syracuse is on the main line; there were frequent trains, and traffic was held up more and more. Finally they elevated the New York Central tracks, at a terrific cost to the city, railroad, and federal government.

The nuclear type of growth has been characteristic of practically every city in the country, although New York, as a unique case, is composed of a series of nuclei that have grown up and then joined (Wall Street, the mid-town area, Rockefeller Center, downtown Brooklyn, Jamaica, Long Island City, etc.) But we begin to see signs of a changing development, of shifts from that urban pattern toward what we generally refer to as *decentralization,* in which all these movements are practically put into reverse. Instead of wanting to be in the center, people are beginning a flight to the edges. Professor Louis Wirth, of Chicago University, presents the theory that industries may move to the periphery, and people live in the cities and go to the edges to work, which in some respects, is a reversal of the present tendency. That theory is counterbalanced by one which holds that the industries and businesses will remain the same as we know them today, and the people will spread out in large metropolitan areas.

Let us consider what changes have been produced since early days. In the first place, immigration has been checked and closely regulated by the federal government. Second, the broad movement of rural families has ceased or slowed up; recent census reports reveal the stabilization of the proportions between rural and urban areas. Third, there is a tendency toward decentralization of our cities, resulting in a breaking down of central concentration. Mature cities have lost population in older, settled sections and satellite communities are growing up on their peripheries. As transportation improves, this tendency becomes stronger. The rate of increase of urban population has declined, while for some individual cities there have been actual decreases of population.

Finally, we have this observation to make. While the costs of government have continued to mount, the burden of taxation and overhead costs has risen without an increase in property values. I regard this as a problem most important to planners. We want to make better use of what we know about planning. The thing we know about planning is that we should provide facilities for people in a greater way than ever before, particularly play spaces, parks, and open spaces, i. e., what would amount to a decrease in density. Yet these proposals do not necessarily lead to higher values; in fact, they are very likely to result in decreased valuations. So we are caught between two opposing tendencies. We are particularly caught when we ask the government, that is suffering from decreasing valuations, to finance the planning and reconstruction. Government asks: "Where is the money coming from?" "The federal government," is the answer.

This is a much more serious problem than such a simple answer implies. The whole subject of decreasing land values is a problem to cities whether they are planned or not. I think as our cities become mature we shall see one after another going through the same phase. Younger, new-born cities in this war period will have an early history like that of New York. Values will increase, but a time is finally reached in the history of the city when it can no longer go forward as rapidly as it goes backward.

Some land values always go backward, but nobody notices it as long as average values go higher. Eventually, a point is reached where the speed of decline is greater than the speed of rise. That point is reached when the following takes place: when the central core of the city, where the highest values reside, begins to lose its attractiveness. Every time there is a 10 percent decline in the center, it must be matched by a 1000

Discussions on Urbanism

(Continued from page 77)

percent increase at the edge, because of the difference in value bases. At the center the land is worth millions; at the edge, thousands.

The second element is the strategic value of location. The city has always accepted the axiom that the edge is not as good as the center, and consequently people won't pay as much for land on the outskirts. The third factor is concerned with improvements rather than land. As we learn to build more cheaply, we may have the effect of inducing not only lower values for land, but also for buildings. We know that there are already at hand much cheaper buildings for smaller types of structures. If we are to rely on the promises of construction engineers, we may have so much attractive new construction going on in less expensive areas that they may not only reduce the base for improvement values but, at the same time, compete unfavorably with improvement values already in the center; and the center is going to look less attractive and be appraised at lower figures. We make much of the ratio of improvement value to site value. When we have high values in the center of the city we say we can't put a certain kind of improvement on that land because it is too valuable.

I started out by saying that there isn't any intrinsic worth in land. The only reason it is said to have value is that people who own it are reluctant to give it up at any level below that contemplated, while the only ones who are willing to use the land are those who refuse to pay what the owners say it is worth. There is still a third party to be heard from, neither the buyer nor the seller, but the city, who says, "Oh, yes, this land is worth this much because we need it for taxation purposes;" and then we hear it said that this is an unfair value. Maybe it is, and maybe it is not. I have been talking with dozens of people who own, control, or finance properties in Manhattan that are said to be "over-valued." These people, with one or two exceptions, frankly admitted that the size of the tax burden isn't the difficulty. The fact is that the original capital investment is too high. This refers particularly to blighted areas. You talk about clearing a piece of land and rebuilding. The land is too expensive! It costs too much. One of my favorite questions to that type of person is: If the land were reduced in capital value, but the size of the tax burden were kept at its present level, would it help, or would it be possible to make a deal on that basis? The answer usually is: "Yes."

What is the trouble then? It isn't that we have cities needing too much revenue and therefore requiring the taxpayer to contribute this revenue. But the city has put itself in a position of demanding an artificially high value level for land in order to provide the necessary tax base. People who hold land, on the assumption that they ought to get what they think it is worth, are reconciled in their belief by the fact that the city underwrites the belief and applies an even higher assessed value. That is the problem of the ratio between improvement value and site value, and it might be looked at from another side.

Suppose we tended to reverse the procedure and followed some of the ideas of Sir Raymond Unwin, of spreading values over larger areas instead of concentrating it in a few areas. We recall that Unwin made some rather careful estimates of the length of time it would take a city to make use of all the potential land that was supposed, ultimately, to be a part of that city. I wish to quote from Unwin in an article in the *Journal of Land and Public Utility Economics,* Feb. 1941:

"The majority of the owners of vacant land within the city must wait one hundred years and many of them two hundred years before they will realize any value from the use of sites for building purposes. The majority of this land has no real value today and is unlikely to have any for generations to come.

"Meantime the owners, on the strength of a gamble with odds of one hundred or two hundred to one against their sites being selected, are holding up their land prices, which compel those very high densities, which in turn increase the odds against them.

"By reducing the density from one hundred to fifty dwellings to the acre the odds would be halved; by reducing it to twelve they would approach the kind of odds which gamblers are willing to face on the race course. To say that if present methods continue such land is really worthless is indeed an understatement, for it is saddled with a considerable yearly liability for taxes."

Unwin believes, therefore, that the correct procedure is to reverse the process in value just as we are now beginning to reverse the process in land use. Instead of concentrating toward the center, we are now beginning to spread out toward the edges.

The last problem is one of purchase of land, and also of taxation. We come also to the question of the future plan of the city, and to what is happening in regard to the provision of available space. I'd like to speak briefly of this situation in New York. Although it is pretty congested, New York still has plenty of space. At the present time there are in private hands undeveloped land and vacant lots, within the city limits, amounting to 38,948 acres. There are, in addition, 12,104 acres of unopened streets. Added together, these total 25 percent of the entire area of New York City. Compare this undeveloped and vacant area with the area used for residential purposes (one-family, two-family, and multi-family buildings) which totals 38,650 acres—slightly less than the total undeveloped area.

In New York there are 1,500 office buildings that cover 12,268,000 square feet of *land.* Rockefeller Center alone provides 5,000,000 square feet of *floor space* on a limited ground area. We can, therefore, grow skyward as well as horizontally, thus increasing the positive elements of supply. In doing this, we are making space less scarce, and we are reluctant to face that fact in considering land values. Land *has* a "scarcity" value. One way to reduce scarcity value is to multiply space by building up in the air. Another is to increase speed of transportation to outlying areas. In the future, one of the familiar methods of transportation may be by helicopter or plane, brought close to the edges of the city. You might have a parking space built in a large circumference and have satellite communities that become a part of a huge metropolitan area. There is no limit to the size to which an urban area can expand. As that type of development proceeds, there is going to be a real limit to the value that can be attached, for taxation or any other purpose, to land within a given city's jurisdiction.

There are several possible solutions to the difficult problem of shrinking values and increasing demands upon local governments. One would be to raise the tax rate, but by raising the rate we rapidly approach a point at which most economists agree we must call a halt, because real estate as an investment would become unattractive, and the money for such investments would diminish. That would tend to shrink the tax base still further, and the process would become a vicious spiral. I do not particularly favor that method. In New York we would have to change the law first. However, we shall probably have to change the law whatever solution we choose.

The solution I have in mind, and on which I have been working for more than a year, is *to drop the dollar value of the base entirely.* That is, instead of attempting to tax land by assigning specific values to it, it might be more expedient to assign a given tax burden to a given type of land use within a certain zone, for a particular use, and for public services rendered. Different zones might have different base rates depending on their location, intensity of use, type and extent of public services supplied, etc. An attempt to do that will be fraught with all sorts of difficulties, but it is not impossible. In fact, we do exactly that now, in disguise. The more I talk with people the more I feel that this is the right track. People agree that the relative levels of burden in our tax system are not so bad. Most of them do not criticize the fact that Rockefeller Center has a higher tax burden than John Smith's home in the suburbs. The two-family house should have a lower tax than the multi-family building. Distinctions can be finer and finer. For example, people may agree that one-family houses should have one rate in a certain zone and a different rate in another zone (because the public services are different). If we agree to perhaps 50 or 60 different classifications, the only job would be to *classify,* instead of attempting to evaluate, individually, thousands of parcels of land, each on its own base. Land would be taxed according to the number of square feet in it, each person paying so much per square foot. If you had a lot 20′ x 100′ and had an eight-family house on it, you would pay at that rate for the whole lot. If you had another type of improvement, then the tax on the land might be rated according to the kind of use to which it is put.

Something must be done to recognize that the value base is no longer an upward spiral. The zoning stalemate holds back progress. People are waiting for that day when the land value corner will turn, and *it very likely won't turn.* This isn't a depression phenomenon, although in New York, for instance, land values have been dropping ever since the beginning of the depression. Perhaps that is why people think it is a depression phenomenon. But while we have experienced an upturn in everything else, land values continue to decline. The peak of real estate values was reached in 1931 when there was a total of $20 billion of assessed value, while the total is nearer $16 billion now.

In many of our cities the center began to lose decades ago, but the decline of values for the total area of the city was at first not noticeable. In New York, for instance, many places in Manhattan, Queens, Bronx, and Brooklyn showed increases, while losses in the central parts have counterbalanced them. The same has been true of Chicago, where values dropped from five to two billion. Boston experienced the same.

We want to recognize, therefore, that in our planning work we may have to figure on lower values rather than higher. We shouldn't try to make values the base, and reconcile everything to them. We can't build high-density projects because the value of the land is high. We would be trying to keep it high, when it might be better to acknowledge that economically it should not be high. To write off outgrown values might be healthy, and in writing off value we may actually bring into the city more taxable capacity, and more ability to pay on land.

5 Population Distribution: Centralization vs. Decentralization, by Lorin A. Thompson, Director, Population Study, Virginia State Planning Board. Author of articles on relationship between population change and administrative planning.

Future trends in concentration and distribution of population in the United States can be appraised only in the light of historic trends as they relate to economic and technological developments. Concentration and distribution of population is determined mainly by economic opportunities. The pattern of economic organization depends to a large extent upon the number of people that must engage in agricultural production in order to support and maintain the remainder of the population. From 1790 to 1940, the primarily agricultural proportion of the population has dropped from 94.9 percent to 43.5 percent. Since 1870, the proportion of the gainful agricultural workers has dropped from over 50 percent to 25 percent. This has been accompanied by development of manufacturing, trade, and service enterprises which have become increasingly important as economic bases. The early American economy had comparatively little trade, service, and manufacturing. During the past 150 years there has been a most phenomenal development in manufacturing, trade distribution, professional activities, and development of a transportation system in America.

Simultaneously with these developments there has also been a corresponding growth in urbanism. During the past 150 years the proportion of the total population living in urban places has increased from 5.1 percent to 56.5 percent. During the first half century (1790 to 1840) the urban population doubled, increasing from 5.1 percent to 10.8 percent of the total population. During the next half century it increased again by three and one-half times, to 35.1 percent in 1890. Since 1890, the relative urban growth has been somewhat slower. A fairly steady rate occurred from 1890 to 1930. Between 1930 and 1940, however, there has been relatively little change. This suggests the possibility that the United States may be rapidly approaching the urban limit.

The indications are quite clear as to the general development. The rapid growth of cities has been accompanied by a rise of manufacturing establishments, the development of trading centers, water transportation terminals, and, later, railroad transportation terminals. There have also been many other developments associated with the production and distribution of raw materials, manufactured commodities, foods, and fibers. Another way of illustrating urban growth is that during the past three decades, our total population has grown from 92,000,000 to 132,000,000, while the farm population has varied but little from 30,000,000. Further urban increases, such as we have had in the past, are dependent upon migration from the farms. This may be expected to a small extent if further mechanization of farming occurs. If additional markets develop for agricultural products, the rural-urban migration may be little more than a trickle. In any case it will be limited.

For more than a decade our manufacturing capacity has more than equalled our consumption, based on pre-war levels of income. During the "depression" the distribution of income was not sufficient to keep factories operating at levels which sustained reasonably full employment. The American economy has developed to the point where our plants, in order to operate at near full capacity, require either high levels of consumption or a vastly-increased foreign trade. Thus the future of our cities is bound up with the development of not only much larger, but more stable markets.

Let us examine the rates of growth among several classes of American cities. The first includes those having more than a million inhabitants. In 1890, 5.8 percent of the total population lived in three cities of more than a million people. Today, five cities with over a million population contain 12.1 percent of the population. The next class of cities has populations between 500,000 and 1,000,000. Their number has increased from one in 1890 to nine in 1940. This group comprised 1.3 percent of the total population of the country in 1890, 5.9 percent in 1920, 4.7 percent in 1940. Cities of this size seem to have small prospects of further increase at present.

In 1890, cities between 250,000 and 500,000 contained 3.9 percent of the nation's population and 5.9 percent in 1940. This same group of cities included 6.5 percent of the nation's population in 1930. This suggests that further gains in population among cities of this class are likely to be slow and depend upon developments around individual centers. The trends are similar among the cities between 100,000 and 250,000. Analyses show that among the various classes of cities throughout the United States none show trends substantially different from the total urban population.

If these trends are projected into the future for a period of ten to twenty years there is little likelihood that cities taken as a group—with individual exceptions — will experience more than nominal increases.

In 1940, approximately 85 percent of the total urban population of the United States lived in 140 metropolitan districts. The metropolitan districts of 1930 included 83 percent of the urban population. Their population increase was somewhat greater than for the country as a whole, the percentage being 9.3 and 7.2 respectively. Between 1930 and 1940 the populations in the central cities in the metropolitan areas increased by 6.1 percent as compared to an increase of 16.9 percent outside the central cities. During the last decade there has been further expansion of suburban areas, a trend now in evidence for several decades. Stating these figures another way, of the total metropolitan increase 54.3 percent occurred outside the central cities; the suburban areas grew 2.8 times as rapidly as the central cities, of which 35 actually declined between 1930 and 1940. This trend is of primary importance in preparing plans for cities in the future. Neighborhoods surrounding central business districts in many American cities have been declining for some years.

The early growth pattern of most of our large cities has centered around a single nucleus, which expanded with the growth of the cities' populations. But since 1920 the automobile, bus, and other forms of rapid transportation have changed the picture, have made it possible for an increased number of people to live in places with more light, air, and open space, at the expense of older sections of the city. As matters now stand, bold measures need to be adopted if this process of disintegration of the center is to be arrested. Cities have been undergoing important transitions from the mono-nucleated to the poly-nucleated. In many instances the modern city is an agglomeration of smaller units, each with its own shopping center and often its own peculiar characteristics. The poly-nucleated city is probably the basic pattern of future urban development.

In a number of our war industry centers a large part of the new development of housing and plants has been in the suburban areas. Thus far, entirely too little attention has been given to the need of community facilities in the industrial and housing developments. If these developments continue as a part of a permanent metropolitan area, within a relatively short time we shall have, as a matter of necessity, extensive developments of community shopping and recreation centers.

The stupid policy of assuming workers need only houses has interfered seriously with efforts to expand war industries.

The tendency in the past to concentrate large numbers of people in small areas has led to a tremendous increase in land values which are increasingly difficult to sustain. As values decline, plus the prospect that property taxes will not decrease, many of the older buildings, now obsolete, will be razed in order to reduce taxes, and the land turned into parking lots. This can scarcely be termed anything but a temporary expedient. It grows primarily out of the fact that we have attempted to concentrate our business structures into small areas without providing enough space for parking and freeway facilities. The absence of such accommodations, of course, naturally tends to encourage the development of suburban areas. Thus the distribution of population within the metropolitan area must be considered in relation to land use.

A number of factors lead me to the conclusion that future urban growth is limited: (1) For more than 20 years there has been little in-migration into the United States. (2) Cities, for a number of decades, have had birth rates far below the population replacement level. Cities have been continually fed by migration from foreign countries and rural areas, and at present, net reproduction rates cannot maintain their present population for any great length of time if these migrations stop. (3) During the past decade the rural birth rate has dropped very noticeably. (In the southeast it has declined 25 percent in ten years.) In the future there will be increasing competition between farms and cities for population. (4) Productive facilities of cities have been geared to an expanding market whereas, during the past two decades, our foreign markets had declined.

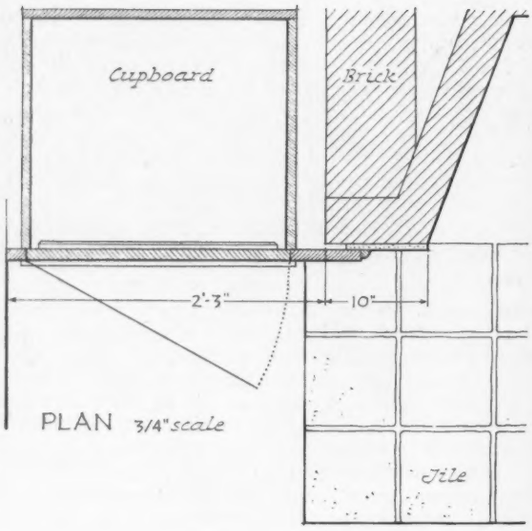
During the thirties our internal population growth has declined more rapidly than during any previous decade in our history. Increased industrial efficiency resulted in some decline in employment. The war has enlarged our total industrial establishment. This development has been mainly in existing urban industrial areas. These developments will influence for at least a decade the location of industry in the nation. Migration has and is taking place in response to the demands of war and has the effect of accelerating urban expansion. This may mean that in view of the decline in fertility in the rural areas, peak growth of cities will come earlier than on the basis of prewar developments, but the prospect of continued growth is less certain.

It should be pointed out, however, that what is true of cities in general does not necessarily apply to individual cities since the size and extent of growth in a particular city depends upon the economic foundations upon which its population can be supported.

(To be continued in the May issue)

Fireplace

Selected Details



PLAN 3/4" scale

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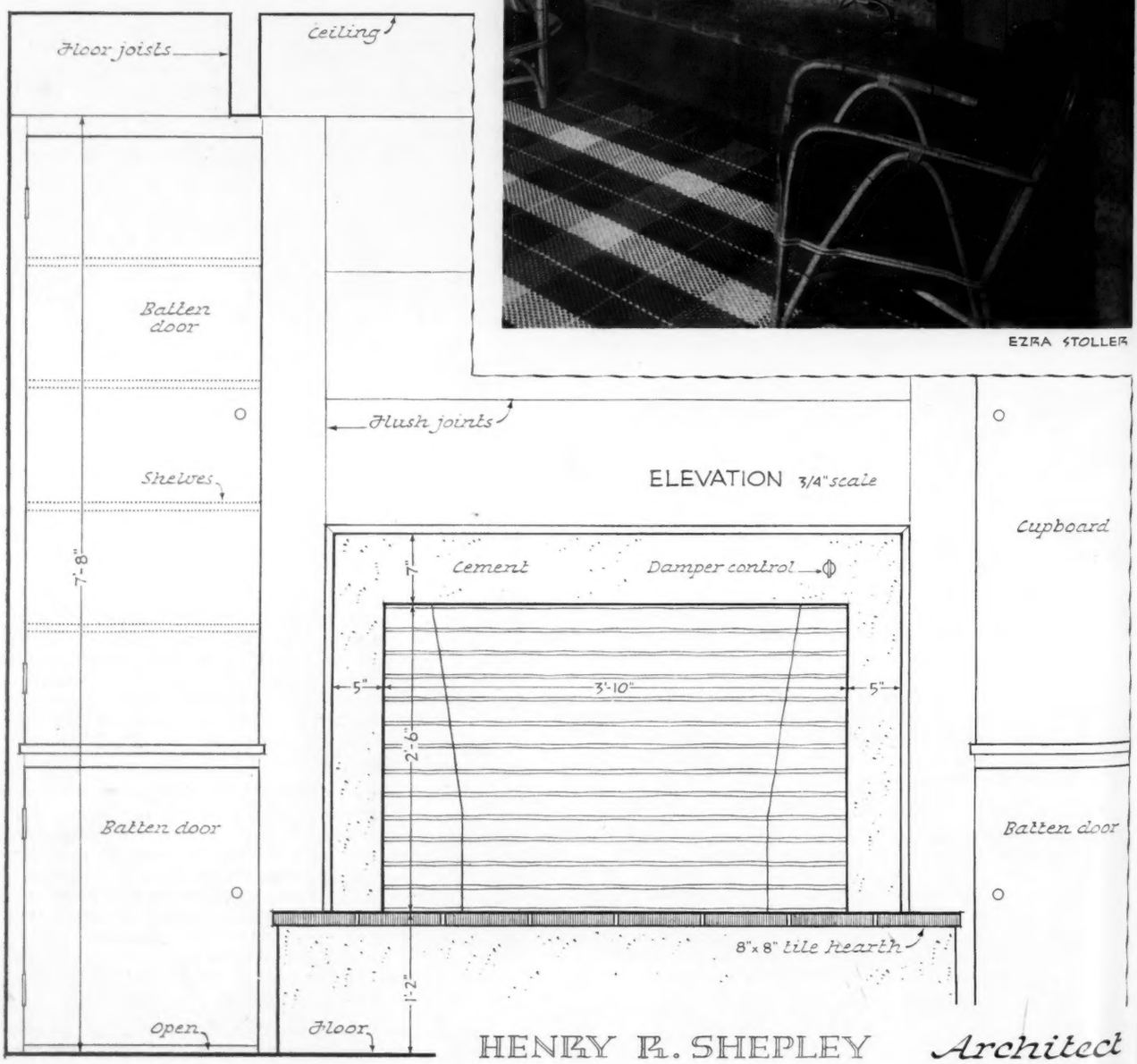

ELEVATION 3/4" scale

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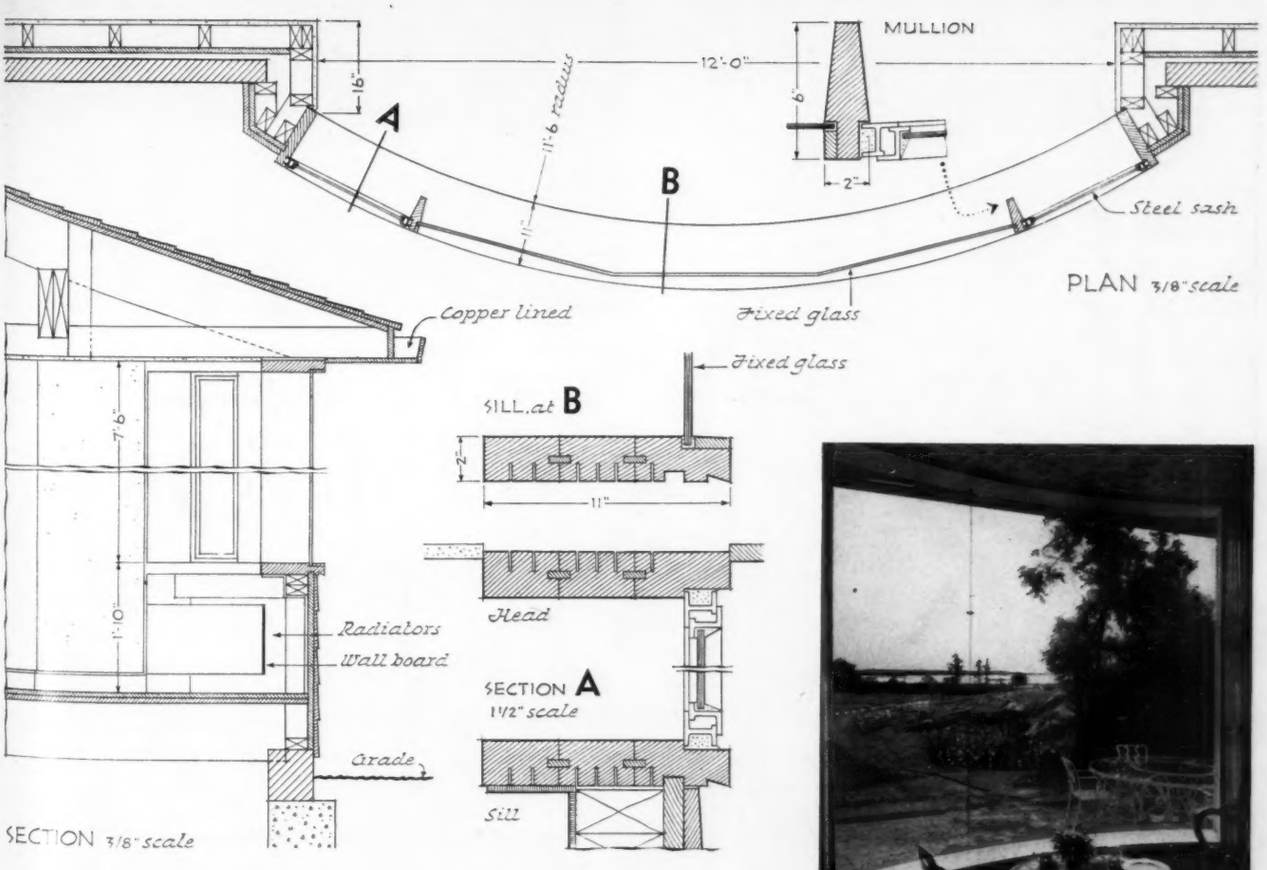

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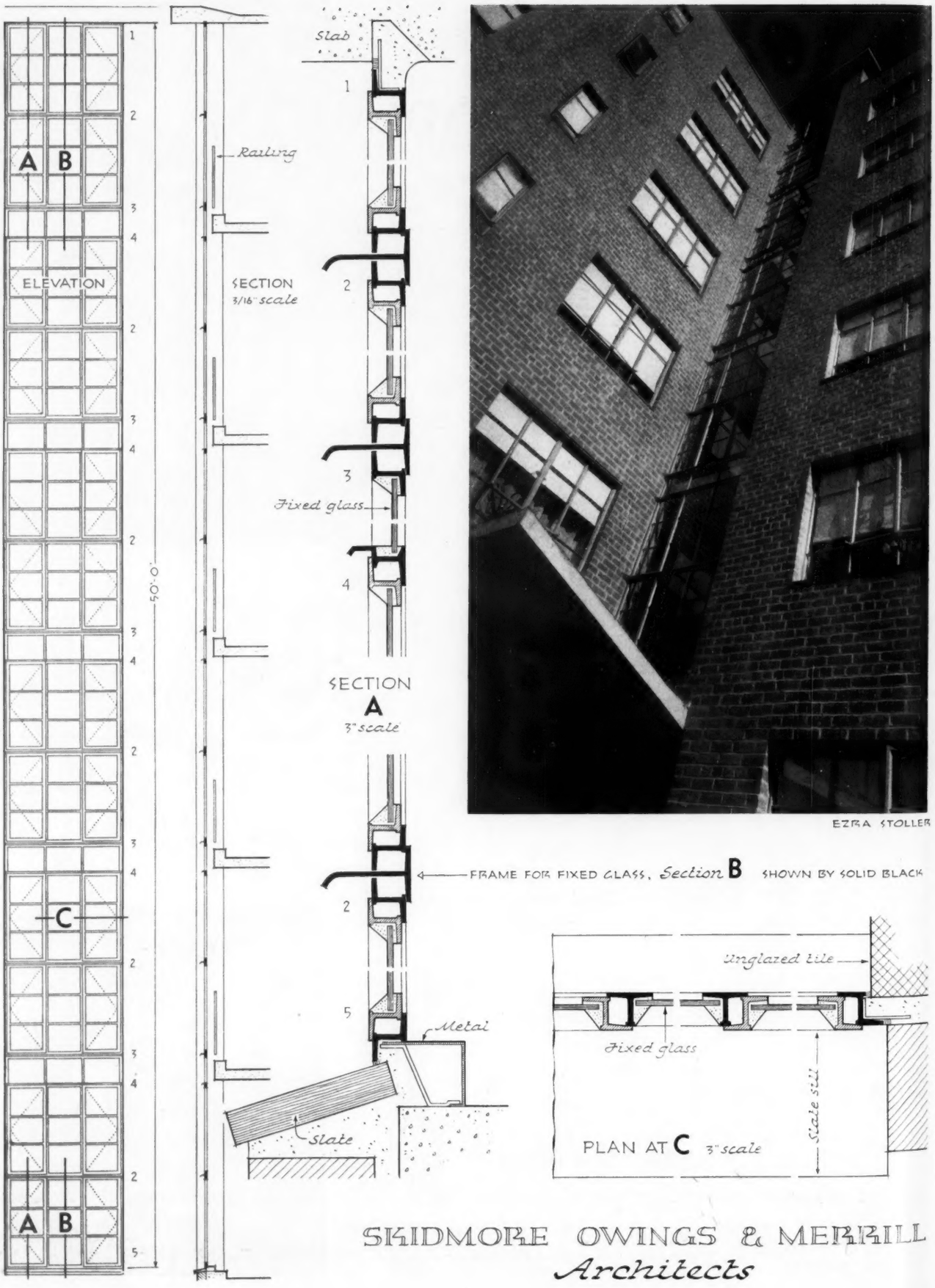

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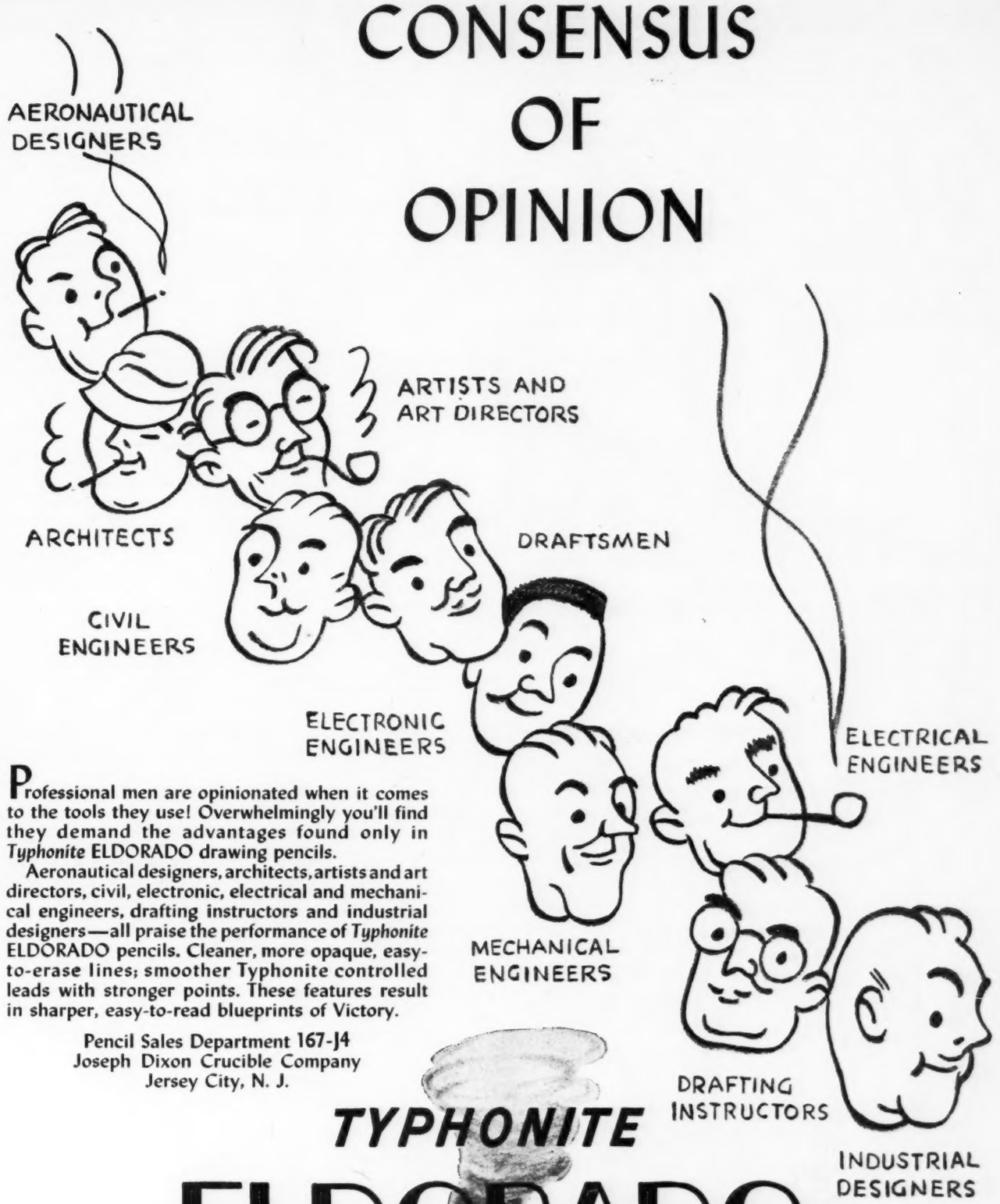

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Publications mentioned here are all 8½" x 11" unless otherwise specified and will be sent free of charge, upon request. When writing for any of the literature noted here, please mention THE NEW PENCIL POINTS.

Paint

Pictorial brochure, "These Plants Make the Paint that Preserves America," from Devoe & Raynolds Co. Inc., First Ave. and 44th St., New York, brings the story of the Devoe organization to those who cannot visit the firm's plants, and serves to educate the firm's employees in the workings of the company. It also depicts various chemical processes and tests to which Devoe paints and varnishes are subjected.

Aluminum

Completely rewritten edition of the "Welding and Brazing Alcoa Aluminum" booklet explains how to correctly use and work the metal. 100 pages, 5⅜ x 8¼", wire bound. Specific instructions for the commercially-important welding (fusion and electric-resistance) and brazing (furnace, torch, and dip) processes are given in the book. Aluminum Company of America, Pittsburgh, Pa.

Back of a thirty-minute bomb attack lie months of work and training, of planning and study, of photographing, measuring, plotting, of making and transporting the hundreds of things which make possible the perfect teamwork vital to success.

By contrast, your task—and ours—of providing sure, safe, instantaneous exit for the occupants of buildings is simple, and easily accomplished.

It requires only your insistence on genuine Von Duprin fire and panic exit devices at all exit doors. Once the devices are installed, you can be certain beyond doubt that—in ANY emergency—every occupant of the building who reaches the doors will get out safely, easily, quickly.

Current model Von Duprins (The Victory Line) are made of strong, non-fracturing malleable iron. They are plain and simple in appearance but in sturdiness, in reliability, they not only equal—but surpass—former models.

Von Duprin

DIVISION

VONNEGUT HARDWARE CO., INDIANAPOLIS, IND.

Temperature Regulation

"Manual of Temperature Regulation," Bulletin S-743, 12 pages, published by Marsh Tritrol Co., 600 S. Michigan Ave., Chicago. Liberally illustrated with charts and diagrams, the booklet presents a comprehensive yet easy-to-follow study of the firm's Tri-trol regulator. Construction, application, and operation of the regulator are described in detail.

Ventilator

Swartwout Co., 18511 Euclid Ave., Cleveland has issued Bulletin 217 describing the NCM line of roof ventilators made of non-critical material. The various designs are patterned after the original metal Swartwout ventilators.

Drainage Fittings

A standard governing cast-iron screwed drainage fittings has been approved by the American Standards Association, 29 W. 39th St., New York. Fittings are designed for drainage systems using ASA standard screw piping, and are provided with shoulders so that when the joints are made up the ends of the pipe practically meet the shoulders, forming smooth passageways. The Standard provides that the "size" of fittings is identified by the corresponding nominal pipe size, and that each fitting shall be marked with the maker's name or symbol. Provisions also govern tolerance, metal thickness, threading, ribs and coatings. The fittings covered in the Standard include elbows, tees, crosses, branches, couplings and offsets.

Flush Valves

Four-page Bulletin 858-W, from Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, gives complete information on the Watrous "V" flush valve for wartime projects, and shows the proper combinations to use to comply with various War Department specifications.

Wood Products

Wood lockers, cabinets, shelving, benches, and other factory equipment of wood are shown in a new 8-page catalog available from Morgan Co., Blue Island Ave. at Wood St., Chicago. Specifications, sectional drawings are included.

Windows

Revised, 12-page catalog on Dura-War wood window units. Window details, hardware details, types and sizes, installation details, mullion details, and full size sections are shown. Truscon Steel Co., Youngstown, Ohio.

Ventilation

For more than a year, Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago, has brought out a series of "Proof of Result Bulletins," now 11 in number. Each bulletin is devoted to a specific heating or ventilating problem, and the solution is given in each case. The factual stories of the 11 installations are now available in bound form.

(Continued on page 86)

LESS LOST TIME
in plants with well-planned
"HEALTH ZONES"

RECORDS of the U.S. Public Health Service show that more than half the absences in industrial plants are due to the common cold and its complications.

This is the type of illness that can be substantially reduced by company health programs, and progressive employers know it. Washrooms, in particular, are receiving more attention than ever before.

It is a fact that modern sanitary washrooms, equipped with plenty of soap, hot water, and individual tissue towels, play an important part in preventing the spread of contagious diseases.

Such washrooms are literally "health zones." They should be planned as an essential part of every industrial building you design. Ample facilities should be provided, in convenient locations, and all fixtures should be placed to insure most efficient use and a smooth flow of traffic.

The Scott Paper Company can aid you in designing washrooms that help keep workers on the job. The Scott Washroom Advisory Service Manual gives basic washroom layouts and suggestions that have proved practical in all types of industrial buildings. For your copy, and a set of Don Graf Data Sheets on washroom planning, write Scott Paper Company, Chester, Pa.

Send for your free copy of the Scott Washroom Advisory Service Manual.

SCOTT WASHROOM ADVISORY SERVICE

ARMOFLOR

. . . a low-cost, traffic-tested floor for wartime building

What it is: Armstrong's Mastic Armoflor is made by calendering a highly wear-resistant composition to an asphalt-saturated felt backing. In use since 1936, this durable, low-cost flooring has a remarkable record of service. Armoflor is supplied in roll form, 3′ and 6′ wide, and in four colors: red, black, green, and brown. Its over-all gauge is .080″. Immediately available without priority.

Why it is better:

- Low initial cost
- Resilient
- Durable
- Moisture-resistant
- Flexible (for use on uneven subfloors)
- Low-cost maintenance
- Can be quickly installed on grade-level subfloors (but not below grade)
- Cements directly to wood or on-grade concrete subfloor
- Suitable for large areas

Where it is used: Stores, offices, recreation rooms, warehouses, buses, street cars, public buildings, hospitals, schools, Army and Navy construction, mass housing projects, and in any low-cost or semi-permanent structure where an extremely durable flooring is required.

For more information on the many wartime applications of Armstrong's Mastic Armoflor, see the 1943 edition of *Sweet's*, or write directly to us. Address all inquiries in care of the Armstrong Cork Company, Floor Division, 2305 State Street, Lancaster, Pennsylvania.

ARMSTRONG'S ARMOFLOR

MADE BY THE MAKERS OF

ARMSTRONG'S LINOLEUM

THE ARMY-NAVY "E" *flies over our Lancaster factories. It was awarded for excellence in the production of shells, bombs, aircraft parts, and many other vital war materials.*

(Continued from page 84)

Lighting.

Four-page folder, "Good Lighting-Better Work", from Edwin F. Guth Co., 2615 Washington Ave., St. Louis, Mo. Discussion on how to obtain suitable priority for conversion lighting and illustrations on various factory-type lighting units.

Plumbing.

Condensed catalog includes representative showing of Eljer plumbing fixtures—bathtubs, lavatories, water closets, sinks, urinals, drinking fountains—for homes, housing projects, commercial and institutional buildings. Color chart shows the twelve standard colors in which the fixtures are produced. Eljer Co., Ford City, Pa. Also published: 12-page folder, 3½″x6″, describing Eljer fixtures for today's industrial and housing needs.

Producers' Council

Bulletin No. 44 from The Producers' Council, Inc., 815 15th St. N.W., Washington, contains literature from the following members describing what they are doing in research and development:

Asbestile flashing system for use with J-M built-up roofs. (A.I.A. File No. 12-H.) Johns-Manville, 22 E. 40th St., New York.

Discussion of Inco nickel alloys for postwar architectural applications. (A.I.A. File No. 15-G.) International Nickel Co. Inc., 67 Wall St., New York.

Wolmanized lumber and Minalith fire-retardant wood for construction work the world around. (A.I.A. File No. 19-A-4.) American Lumber & Treating Co., 332 S. Michigan Ave., Chicago.

Marble toilet units. (A.I.A. File No. 22-A-3.) Vermont Marble Co., Proctor, Vt.

Light-reflecting floors made with Atlas white cement to help speed war production. (A.I.A. File No. 23-D.) Universal Atlas Cement Co., Chrysler Bldg., New York.

The use of Marlite wall panels for war construction, commercial and home building. (A.I.A. File No. 23-L) Marsh Wall Products, Inc., 1253 Main St., Dover, Ohio.

B & G Monoflo system of forced hot water heating for homes, institutions, factories, barracks. (A.I.A. File No. 30-C.) Bell & Gosset Co., Morton Grove, Ill.

All types and sizes of gas water heaters for hot water needs and built for installation in any size project. (A.I.A. File No. 29-D-2.) Premier Heater Division, Bastian-Morley Co., LaPorte, Ind.

War plant ventilators for blackout and other factory buildings. (A.I.A. File No. 12-K.) Carrier Corp., Syracuse, N. Y.

New Enterprise plumbing line designed for all wartime installations, and complying with Army Specifications PE623. (A.I.A. File No. 29-H.) The Crane Co., 836 S. Michigan Ave., Chicago.

Service Sheet No. 43 (A.I.A. File No. 16-D) on horizontal and vertical slide wood doors for hangars and industrial entrances. The Peelle Co., Stewart Ave., Brooklyn, N. Y.

The Plastoid method for glazing wood sash with elastic bedding cement is described in A.I.A. File No. 26-B-2 folder. Plastic Products Co., 6481 Georgia Ave., Detroit, Mich.

Richmond products for concrete formwork. (A.I.A. File No. 4-D-3.) Richmond Screw Anchor Co. Inc., 816 Liberty Ave., Brooklyn, N. Y.

Double-hung wood windows counterbalanced with Pullman unit balances. (A.I.A. File No. 27-A.) Pullman Mfg. Co., Rochester, N. Y.

Sheet describing three new films which show up-to-date methods of joining aluminum. (A.I.A. File No. 15-J.) Aluminum Company of America, Pittsburgh, Pa.

Weatherstrip insulation, calking insulation, storm window insulation, and rock wool insulation provided by Chamberlin products. (A.I.A. File No. 37-B.) Chamberlin Metal Weatherstrip Co. Inc., 1375 LaBrosse, Detroit, Mich.

Stainless and galvanized steel metal products for hospitals, churches, schools, homes, institutions, and industrial plants. (A.I.A. File No. 35-C-12.) Elkay Mfg. Co., 4703 Arthington St., Chicago.

Information on Moncor surface wiring devices, GE building wire, and other wiring material information. (A.I.A. File No. 31-C.) General Electric Co., Appliance Department, Bridgeport, Conn.

New and varied applications of Vitrolite, Vitrolux, Thermopane, Tuf-Flex, other LOF glass. (A.I.A. File No. 26-A.) Libbey-Owens-Ford Glass Co., Toledo, Ohio.

Economies of full-house insulation are described in a two page sheet, A.I.A. File No. 37-B, from National Mineral Wool Association, 1270 Sixth Ave., New York.

Stanley hardware items which meet the specifications of the Defense Housing Critical List. (A.I.A. File No. 27.) The Stanley Works, New Britain, Conn.

Wartime developments of Stran-steel are incorporated in a letter addressed to the construction industry by Great Lakes Steel Corp., 1130 Penobscot Bldg., Detroit, Mich. (A.I.A. File No. 13-G.)

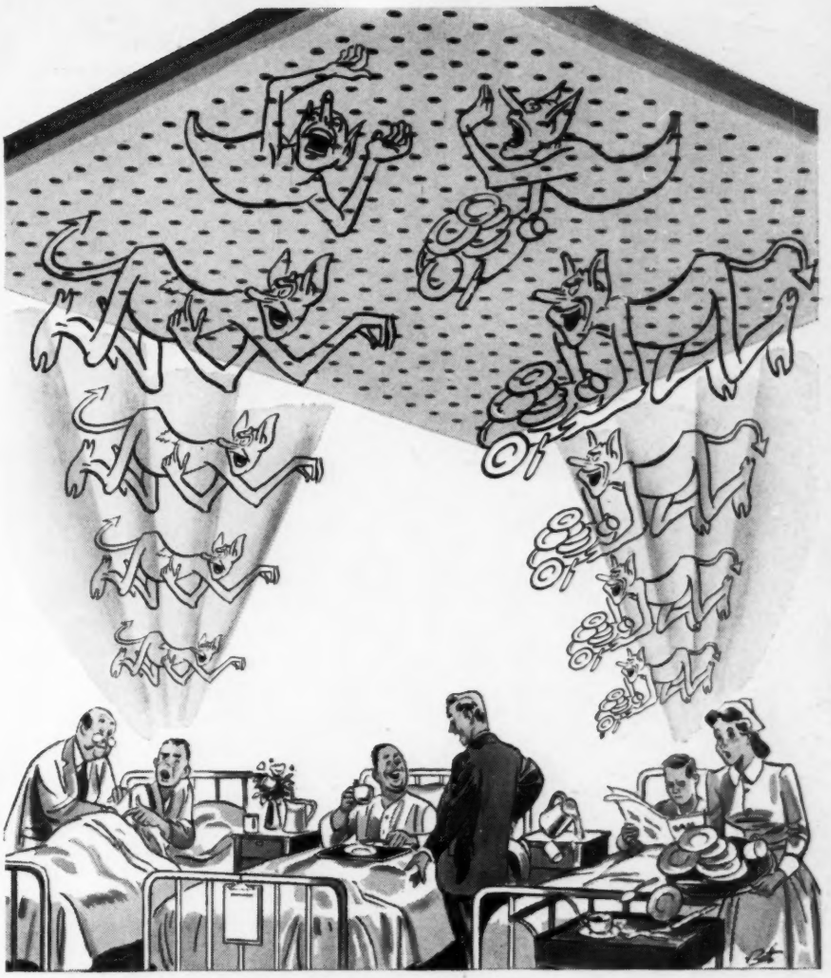
Zinc-Coated Metal

File-size, 26-page booklet, "Useful Facts about Armco Zincgrip," designed to assist engineers, workers, and executives in using the product, and containing suggestions on specifying, ordering, fabricating, and finishing this zinc-coated sheet metal. Sections are devoted to physical properties, deep drawing, roll and brake forming, welding, cleaning, soldering, and finishing. Available to buyers and users of sheet steel. American Rolling Mill Co., 750 Curtis St., Middletown, Ohio.

Building Exits

The American Standards Association, 29 W. 39th St., New York, has approved as an American Standard (ASA No.: A9.1-1942) the seventh edition, 1942, of the Building Exits Code, developed under the leadership of the National Fire Protection Association. Both engineering and occupancy egress requirements are fully detailed. Included are stairs and stair enclosures, outside stairs (fire escapes).

(Continued on page 88)



NOISE DEMONS PERISH

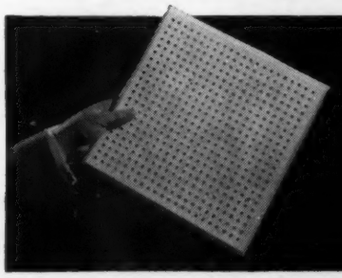
... trapped in a ceiling of Armstrong's Cushiontone

IT'S EASY to get rid of the noise demons that harass the sick and convalescent. Just trap them in a ceiling of Armstrong's Cushiontone. Each 12″ x 12″ unit of this new material has 484 deep, sound-absorbing holes that stay on the job every minute to keep hospital areas real "Quiet Zones."

Actual tests show that a ceiling of Armstrong's Cushiontone absorbs up to 75% of the sound that strikes its surface. This remarkable efficiency is never lessened by maintenance or repainting.

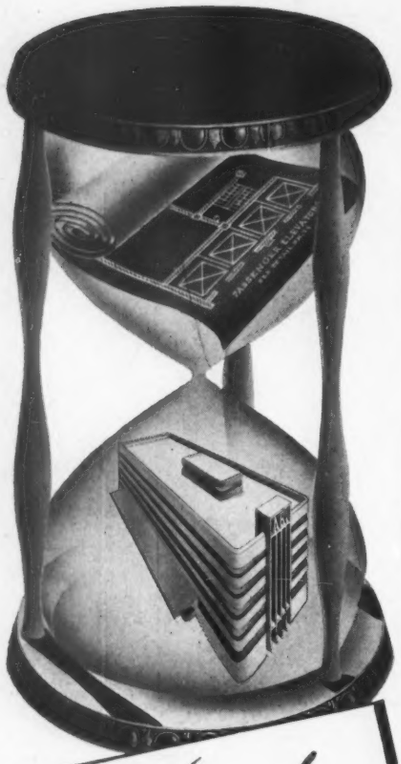
Low-cost Cushiontone is factory-painted, ready to install (with little interruption to routines), and easy to maintain. You'll like the way its ivory-colored surface reflects light, improving illumination.

LET US SEND YOU a copy of our new booklet which gives all the facts about Armstrong's Cushiontone. Write Armstrong Cork Co., Building Materials Div., 6904 Stevens St., Lancaster, Pa.



Armstrong's Cushiontone

Made by the Armstrong's Linoleum makers of and Asphalt Tile



When the FUTURE BECOMES THE PAST!

Plans now on your drawing board will some day be completed projects. When that time arrives, the material and equipment which you specify must deliver. This will be the yardstick by which your work will be judged. Where freight or passenger elevators are required, specify Montgomery. Proof of the fact that they deliver is found in Montgomery's sales record. During 1941, a typical year, 72% of all the Montgomery Elevators installed were sold to previously satisfied customers. 28% were for new customers. Investigate Montgomery's "Elevator Planning Service" for assistance in solving special elevator problems. No obligation!

DON GRAF DATA SHEETS on Passenger and Freight Elevators. Use the coupon to get your FREE set!

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YES! Please send me FREE Don Graf Data Sheets on Montgomery Passenger and Freight Elevators.

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Firm Name .....
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City ..... State .....

(Continued from page 87)

ramps, horizontal exits, doors, aisles and corridors, elevators, escalators, slide escapes, alarm systems, fire exit drills, and signs and lighting. Occppancy egress requirements specified include, in addition to general requirements, those for schools, department stores, factories; hospitals, sanitariums and corrective institutions; places of public assembly, hotels and apartment houses, and office buildings. The 112-page book is priced at $1.

Redwood

Data sheets from California Redwood Association, 405 Montgomery St., San Francisco, containing pertinent information on Redwood lumber and its utility in construction. Illustrated with tables, drawings, and pictures, the bulletins range from two to 16 pages, are of uniform size (8½x11″), and are punched for handy insertion in standard three-hole binders. Data sheets are available on Redwood Tanks and Vats, Redwood Pipe, Mill Roofs, Built-Up Redwood Gutters and Drainpipe, Industrial Sash and Frames, Industrial Fences, Redwood Laminated Culverts, Redwood Expansion Joints, Redwood in Sewage Treatment Plants, Reservoir Roofs, California Redwood—Its Properties and Uses.

Control Equipment

Bulletin 720 on such automatic control equipment as magnetic contactors, remote control switches, automatic transfer switches, reversing controls, etc. Details of construction, latest improvements, applications, and prices are given. Six pages. Zenith Electric Co., 152 W. Walton St., Chicago.

GOVERNMENT PUBLICATIONS

Building.

Fire-resistance classifications of building constructions, report of Subcommittee on Fire-Resistance Classifications of Central Housing Commitee on Research, Design and Construction. Oct. 7, 1942. ii + 70 p. 4°. (Building materials and structures report BMS92.) Paper. C 13.29:92. Superintendent of Documents, Washington, D. C., 25c.

Building.

Recommended building code requirements for new dwelling construction, with special reference to war housing, report of Subcommittee on Building Codes, Central Housing Committee on Research, Design, and Construction. Sept. 25, 1943. ii + 86 p. 4°. (Building materials and structures report BMS88.) Paper. C 13.29:88. Superintendent of Documents, Washington, D. C., 20c.

Building.

National emergency specifications for design of reinforced concrete buildings. Nov. 10, 1942. (1) + 38 p. Pr 32.4802:C 74. War Production Board, Washington, free.

(Continued on page 90)

Send for a new artist's colored pencil that is...

SO STRONG that every color takes a fine point every time.

SO DURABLE it holds a point under pressure without crumbling.

SO SMOOTH in every color that it speeds your drawing hand.

SO BRILLIANT it's extensively used for finished art work.

SO UNIFORM in texture that all colors blend together perfectly.

SO PERMANENT that no color shows any appreciable change under Fade-Ometer tests comparable to a full year of sunlight.

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908 Dark Green	*932 Violet
†*909 Grass Green	†*935 Black
†*910 Emerald Green	936 Dark Grey
911 Olive Green	*937 Light Grey
*912 Apple Green	†*938 White
†*915 Lemon Yellow	*939 Flesh
*916 Canary Yellow	*942 Yellow Ochre
917 Yellow Orange	*943 Burnt Ochre
†*918 Orange	*944 Terra Cotta
†*921 Vermilion	*945 Sienna Brown
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ADD *Aluminum in Color* TO YOUR POSTWAR THINKING

Aluminum finished in bright colors and pastels, in black, silver and gold, with bright and matte surfaces; colors dyed right into the metal. This is no idle dream. It's an actuality, something on which you can safely let your postwar thinking dwell.

Research has been at work constantly, seeking better finishes for the aluminum that is going into airplanes, parts and accessories. They've found finishes that give greater resistance to corrosion, better adhesion for paints, blacks for reduced visibility, colors for identification.

Architects are always seeking new ways of expressing themselves, of achieving unusual and more beautiful effects. These finishes for aluminum offer a means of expression. Of course, you can't start using them now, nor the metal, but it's none too early to be thinking thus—

Aluminum, with its lighter weight, easy and faithful fabrication, ability to resist corrosion, adds color to its surroundings. ALUMINUM COMPANY OF AMERICA, 2198 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALCOA ALUMINUM REG. U. S. PAT. OFF. **ALUMINUM**

for wartime duplication of steel rolling door efficiency

KINNEAR WOOD ROLLING DOORS

Smooth, quick, easy operation . . . a rugged interlapping-slat curtain that coils compactly out of the way and out of reach of damage . . . maximum savings in floor, wall and ceiling space . . . full protection against wind and weather . . . choice of motor or manual control . . . neat, modern appearance! The Kinnear WOOD Rolling Door duplicates these famous advantages of the Kinnear Steel Rolling Door *with maximum savings in war-vital steel!* Any size, for new construction or replacements. The Kinnear Manufacturing Co., 1900-20 Fields Ave., Columbus, Ohio.

Doors that SAVE STEEL *for* WAR NEEDS *Write today for Bulletin 37*

SAVING WAYS IN DOORWAYS

KINNEAR ROLLING DOORS

(Continued from page 88)

Hardware Manual.

July 15, 1943, revised as of Nov. 1, 1942. (1) + 45 p. (Industry Operations Division.) Paper. Pr 32.4806:H 22/942-2. Paper. Superintendent of Documents, Washington, D. C., 10c.

Walls.

Accumulation of moisture in walls of frame construction during winter exposure (with list of references); by Charles G. Weber and Robert C. Reichel. Nov. 4, 1942. ii + 5 p. il. 4°. (Building materials and structures report BMS93.) Paper. Superintendent of Documents, Washington, D. C., 10c.

Walls.

Water permeability and weathering resistance of stucco-faced, gunite-faced, and Knap concrete-unit walls; by Cyrus C. Fishburn. Dec. 2, 1942. ii + 20 p. il. 4°. (Building materials and structures report BMS94.) Paper. C 13.29:94. Superintendent of Documents, Washington, 10c.

MANUFACTURERS' DATA WANTED

RICHARD H. BARNES, Architectural Engineering Student, 120 Francis St., Colwyn, Del. Co., Penna. (Data for A.I.A. file.)

HERMAN EDGERT, Student (Pratt Institute), 1331 Rogers Ave., Brooklyn, N. Y. (Data for complete A.I.A. file.)

HERBERT M. L. GIDUZ, Chairman, Committee on Materials and Methods, Boston Chapter AIA, 92 Arlington St., Winchester, Mass. (Manufacturers' literature on building materials and methods.)

WALDON E. MOORE, General Foreman, Federal Correctional Institution, Milan, Mich. (Data for complete A.I.A. file.)

JOHN A. RUSSELL, Department of Architecture, University of Manitoba, Winnipeg, Canada. (Information on new construction methods, materials, finishes, fixtures, and samples of new products for its collection of materials.)

THE MART

KENNETH G. PHILLIPS, Engineer, 1884 Colonnade Road, Cleveland, Ohio, has the following copies of PENCIL POINTS for sale: April, 1940-May, 1942. Perfect condition. No break in continuity.

JOHN ALFRED WAHL, 3150 Rochambeau Ave., New York has the following magazines for sale: PENCIL POINTS—October, 1938-December, 1941; ARCHITECTURE—November, 1934-May, 1935; AMERICAN ARCHITECT — June-August and October-December, 1936; January, February, June-September, 1937; ARCHITECTURAL RECORD —October-November, 1936; July, 1937; June, 1938-December, 1939; 1940 (except February and August).

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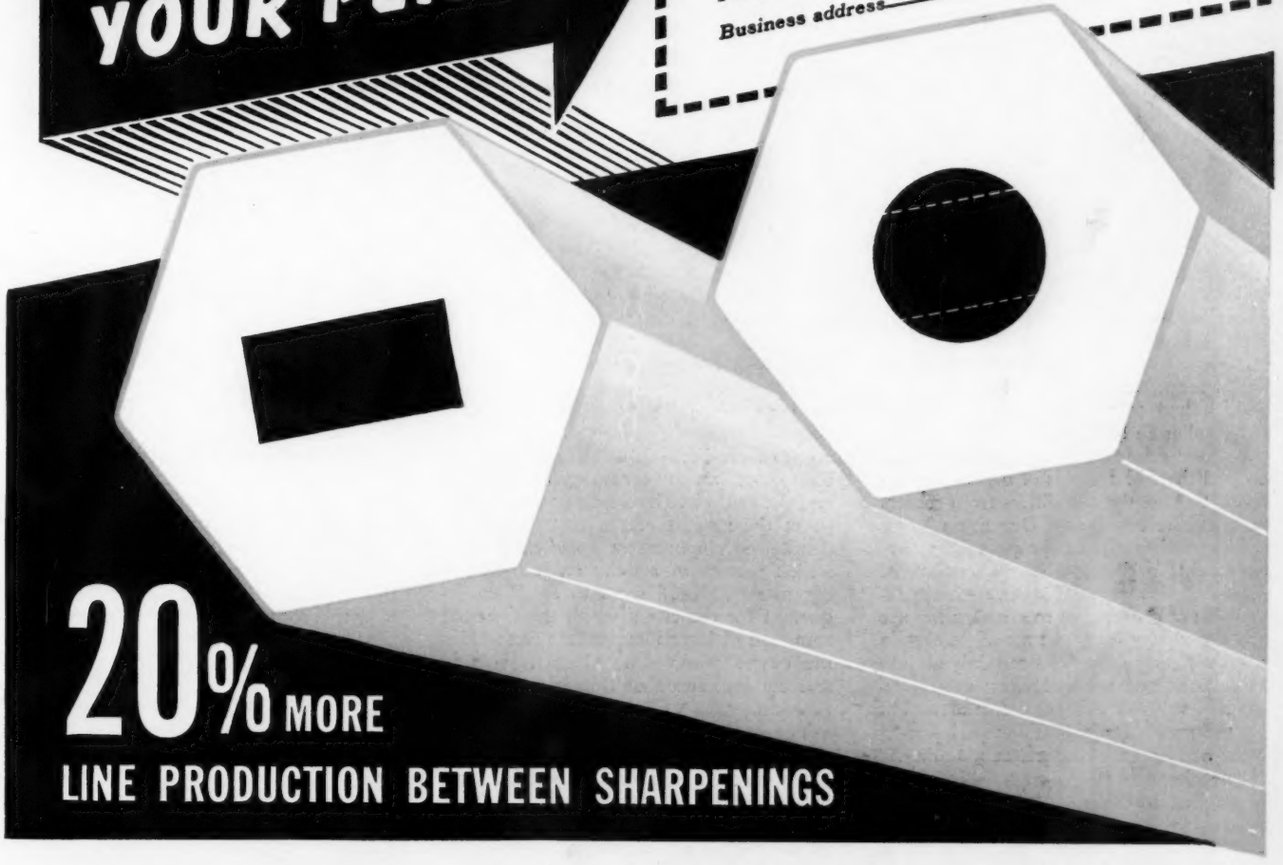

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Books and Periodicals

New York Plans For the Future

By Cleveland Rodgers, published by Harper & Bros., 49 E. 33rd St., New York. (293 pages, 5¾"x8¾", illustrated, $3.)

This book is the fascinating mirror of a typical city-planning mind, with its good nature, common sense, and mental horizon as uneven as the Russian battle line. Mr. Rodgers is a member of the New York Planning Commission who is also a gifted newspaper man. He writes a clear, rounded, popular exposition of New York's planning history, so full of matter that it is a book the experts will not wish to miss. The book shows how far we have come; also, through its own limitations, how very far we still have to go. Burnham, fifty years ago, was concerned about Boulevards; Mr. Rodgers writes his key chapter about Babies. That's real progress. On the other hand, the author is so steeped in the narrow New York tradition that it is a little uncertain which comes first in his mind, babies or real estate: "Morals and sentiments aside, babies and more babies are needed if landowners, landlords, lending institutions and others who have a stake . . . " In a pinch you will generally find him pretty well over toward the side of the three l's.

Early in the book comes an acute observation about New York. The city has ever been linked to the destinies of Britain. "The dollar and the pound were gold-dust twins"—a prime reason why New York escaped the worst effects of depressions up to 1929. Also, the city differs from centers such as Cleveland and Detroit in being not so much a production point as a control point; and the chief instrument of control is finance. Invention, says the author, is not confined to mechanics; finance can also evolve "daring forms." A certain surplus of this energy did certainly go into New York real estate devices; in this respect New York did not stand alone but set the pace. Hence the national importance of New York efforts at planning.

The city never recovered from its loss of the first round. Mr. Rodgers has done a remarkable service in digging out of oblivion the story of the city's ownership, in 1686, of all the undeveloped land in Manhattan. But the city, like the country at large, took the line of least resistance, and met its debts not by taxation but by giving away this abundance. Thereafter, the story has pretty regularly been one of giving important things away. A striking example, cited by the author, is the transportation furnished to the city periphery, promptly seized upon by commuters. The city thus paid for its own evacuation, creating what is now an abiding problem.

In dealing with such problems—and he goes into them all—the author tends to blur the edges of the picture, to endow the situation with something less than its full force and immediacy. Thus, for example, he surprisingly declares that the Els did not overexpand, "being in private hands." On the contrary, the running of the Els into open country was notorious, and the stimulus was not just fares but land speculation. If a strip were taken today alongside a subway line, half a mile wide, the first quarter-mile would be found to include 90 percent of the population. Within ten years after subway construction, land values increased by 1,000 percent at the stations. Such statistics as these, not quoted by the author, have some bearing on the city's present investment of $1.6 billion in the three transit systems, and, still further, on plans now promulgated by the Board of Transportation for an investment of another $1 billion on expansion. Mr. Rodgers puts the city's annual subway subsidy at $30 million, and others have put it at $40 million, depending on methods of accounting. The latter sum is only a little less than a Parliamentary Committee has estimated would be required by a Planning Authority to acquire full annual development rights in all the land outside built-up areas for all Britain. Citizens and landowners in other sections alike have a right at least to the minimal safeguards of Master Planning. At other points, too, the author leads right to the edge of a snag and there bounces into rhetoric. We are told, for example, that the large lending agencies are developing at high density both in the city center and at the periphery; in Parkchester no less than in Knickerbocker Village. The Commissioner recognizes that there is a tug-of-war between the kind of peripheral development encouraged by FHA and the central redevelopment that would be in the interest of the city. But high-density development at *both* ends, as a settled pattern of activity on the part of big money, would seem to entail consequences for the city through the financial ruination of large intermediate areas. Has the city a plan? The Commissioner scarcely indicates that this is a full-dress problem.

The book has certain fairly large blank areas. In the index there is listed not one other city than New York, either European or American. This is a regrettable evidence and encouragement of New York parochialism. In planning, New York stands incomparably behind such cities as Amsterdam, or Stockholm with its thousand-year planning tradition. Now of all times is no time to withdraw into homespun insularity.

Again, the Commissioner has a very faulty knowledge of architecture and no apparent interest in planned organization of the building industry. British postwar plans are being organized as ten- or twenty-year programs involving labor plans, materials plans, plans of industrialization, and financing devastated areas. Has New York anything similar to offer?

The lack of observable influence from the kind of architectural city planning that has been developing throughout the last twenty years around the world will reflect itself in New York, one fears, not only in loss of amenity but in further needless costs. Thus the author describes some kind of a scheme for a Grand Central Station for automobiles, to be reached by traffic subways. That is the old City-Beautiful, monumental way of doing things. Perhaps it is the best; but it is worth serious challenge. As Get-Rich-Quick Wallingford used to say, "The profit is in the digging." If the Commission intends to use $22 million drawing up plans for a postwar program of $628 million, then it is high time for some new architectural light and air to be let in, not to mention a saving of the taxpayers' money.

Not the least disturbing feature in the book is the airy dismissal of what the author calls the "vague and grandiose schemes" of the Master Plan that was discarded when Mr. Moses came to dominate the Planning Commission. It would have been nice to know what those schemes were. This is the more important to the independent citizen because, as Mr. Rodgers describes Mr. Moses, the present dominant New York planning figure, "His method is similar to a military leader who concentrates on limited objectives and makes definite gains in given sectors without disclosing larger purposes of strategy." Not going in for blind trust in any leader, the citizen would rather like to have the larger purposes disclosed.

Summarizing: Mr. Rodgers has performed a valuable service in outlining the whole range of New York's planning history and problems. It is a very readable book, good-natured, well-intentioned, but too diffuse. There is not a clear enough separation in the author's mind between the public (or productive) interest and the speculative interest. This distinction is going ahead so rapidly in other countries, notably Britain (to which New York is tied), that a CHRISTIAN SCIENCE MONITOR correspondent is worried lest the two countries come out of the war not even speaking the same language.

Douglas Haskell

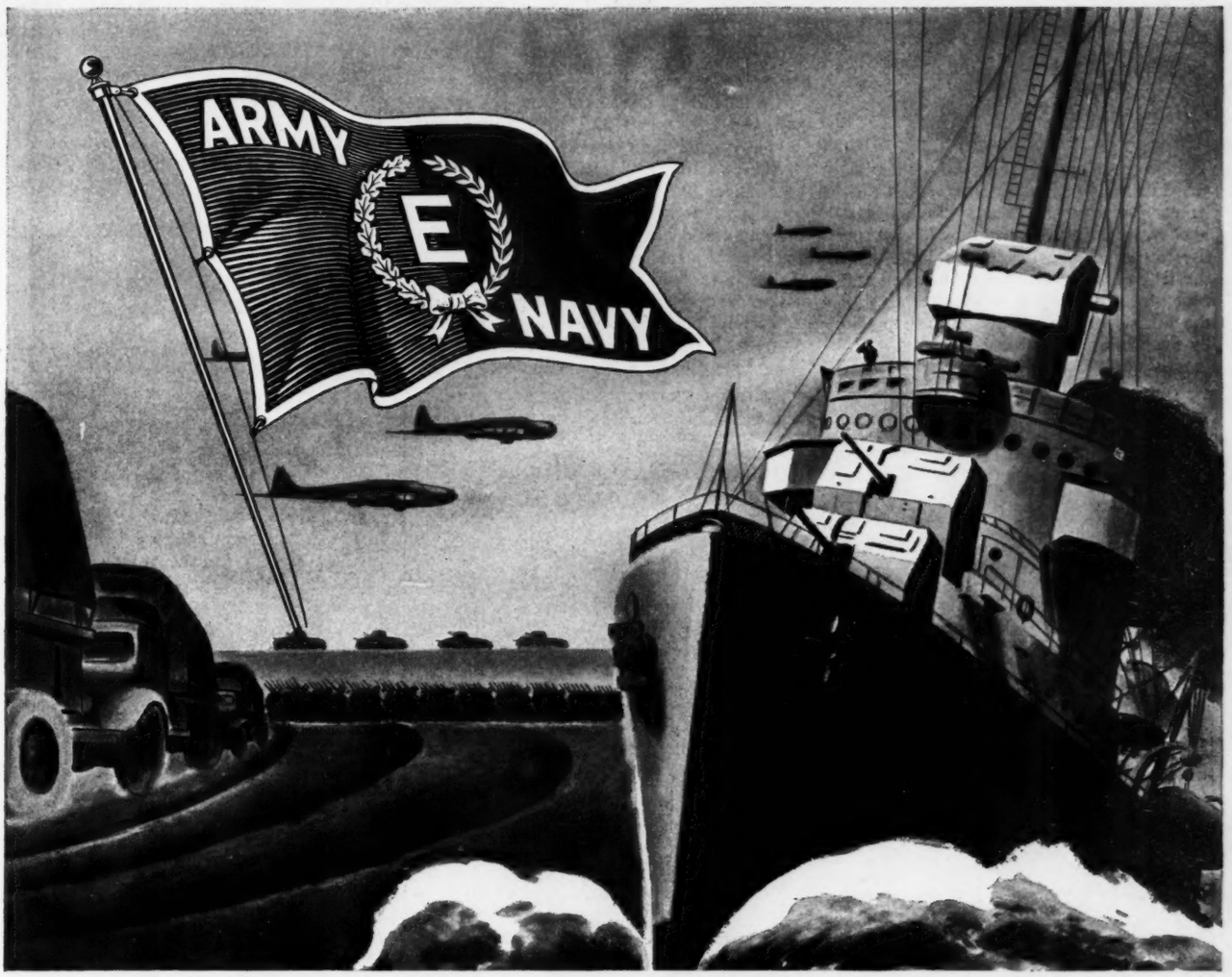
• • •

Lee Mansion

By Randle Bond Truett. (56 pages, 5½ x 8¼, 73 gravure illustrations, $1.25. Hastings House, 67 W. 44th St., New York.)

The area surrounding Washington, D. C. is dotted with many historic buildings. Typifying that period of American history prior to 1860 when gracious living and unrestrained hospitality were synonymous with the South is the historic Lee Mansion in Arlington, Va., built by Martha Washington's grandson. The house overlooks the city of Washington and today is a national memorial. The gravure illustrations show the mansion in all its charm and simplicity from basement to attic, from grandiose living room to slave quarters.

(Continued on page 94)



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(Continued from page 92)

Fluorescent Lighting Manual

By Charles L. Amick, Nela Park Engineering Department, General Electric Co. (McGraw-Hill Book Co., 330 W. 42nd St., New York, 312 pages, illustrated, $3.)

This is a comprehensive volume on the subject of fluorescent lighting and should be part of every architect's library. Starting with a short introduction covering the history of the fluorescent lamp from the first recorded discovery of the fluorescent phenomena by a shoemaker in 1602, the author brings the subject up to date by describing the construction and workings of the present-day fluorescent lamp.

Written in simple language and well integrated, the book covers the subject in a readable form, with excellent diagrams, tables, and illustrations through the text.

The author presents an unbiased picture of the advantages and disadvantages of this type of light source, with valuable advice as to the selection of the various auxiliaries. Many types of luminaires are analyzed as to their efficiency and effectiveness and tabulated in a form which enables the reader to select the type most suitable for any special purpose. After the type is selected, the designer is free to create his own fixture which would probably be more in line with modern design than the photographic examples shown.

The illumination requirements of various spaces and working surfaces is well covered and documented. The possibility of new uses is also thoroughly explored.

In the second part of the book a series of photographs and diagrams show examples of fluorescent lighting in use. The appendix, in tabulated forms, condenses a great deal of information previously published on this subject.

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Factory addition in Michigan. W. P. McLaughlin, Grand Rapids, architect.

Handbook of Architectural Practice

Revised 1943 edition published by the American Institute of Architects, 1741 New York Ave., N.W., Washington, D.C. ($5 a copy. 204 pages, 8½"x11", cloth cover.)

The scope of the fourth edition of this handbook is described by its table of contents, printed herewith.

"The architect, though primarily an artist, must still be the master, either in himself or through others, of all the applied sciences necessary to sound and economic building, sciences that have generated and that attempt to satisfy many of the exacting and complex demands of modern life. But it is not with construction or engineering or with the choice of materials that the Handbook deals.

"The Architect, by expressing his ideas in forms and words of exact contractual significance, by controlling machinery for their embodiment, by giving just decisions between conflicting interests, by bearing himself as worthy of his high calling, gives to his art the status of a profession. It is with that aspect of the Architect's work, professional practice, and its servant, business administration, that this Handbook is concerned."

Chapters are devoted to the organization of the architect's office, letting of contracts, execution of work, the architect and the law, the architect and the owner, etc. It should help the architect so to organize his office procedure, forms, methods, and the business side of his practice that he will be prepared to render more efficient service in the work which is sure to come in the postwar building era.

Though it is priced at $5 a copy, architectural students may purchase copies of the Handbook for $4, provided orders are countersigned by the deans of their departments of architecture.

* * *

PLANNING BIBLIOGRAPHY

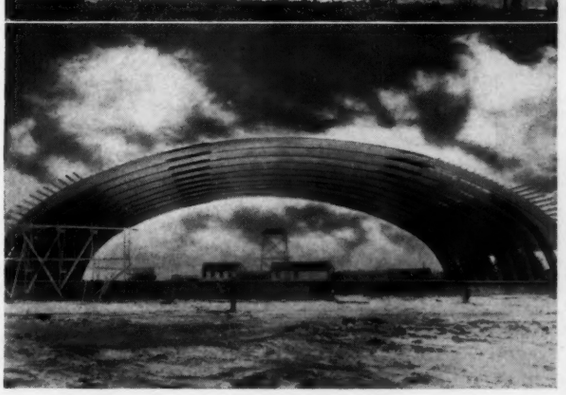
Second in the series of annotated bibliographies of planning literature, by Margaret Greenough King.

Memorandum

Cranbrook Academy of Art, September 10-11, 1942. An introduction to the round table discussion suggested by the Urban Land Institute held at Cranbrook. Starting from comments on the Institute's two pamphlets, *A Proposal for Rebuilding Blighted City Areas,* and, *Outline for a Legislative Program to Rebuild Our Cities,* the *Memorandum* notes necessary

(Continued on page 96)

Hangars FOR PLANES...



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(Continued from page 94)

legislative measures for the program, control of land price, a broadened law of condemnation, and transference of property rights.

Give MOTCP Full Powers

ARCHITECT'S JOURNAL, February, 1943. In their journal English architects are urged to put planning and the ability to sound the go-ahead in the hands of one positive body. (MOTCP is Britain's Ministry of Town and Country Planning.) Perhaps a suggestion to America since Britain seems as overstuffed with alphabet agencies as we.

New Zealand's Experience With Land Value Taxation

By the Honorable Walter Nash, Minister of New Zealand to the United States. An address before a joint meeting held in New York on January 23, 1943, by the American Institute of Planners and Citizen's Housing Council of New York. It takes up New Zealand's solutions for land-value taxation. The problem is considered in two parts; first, the national land tax on unimproved land values; second, the local tax, also on the basis of unimproved land values. Of major interest are the method of land evaluation used and the response of property owners to the program.

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Report on Master Plan of Land Use

Proposed by the City Planning Commission—Citizen's Budget Commission, Inc., New York, 1941. A brief statement of the land use plan and of criticisms by business men and planners alike. The committee believes New York is not a dying city if aid comes soon enough, but that after the war, if intelligently planned it will have a leading role in the world. The importance of readjusting taxation and zoning laws is stressed.

Municipal Yearbook

Published by International City Manager's Association, 1942. A series of chapters by different authorities on statistics of city needs and problems, with a discussion of their significance. Such topics as Wartime Organization of Cities, Planning and Zoning, Municipal Utilities, Public Works, Traffic Safety, Governmental Data for Cities over 5,000 Population, etc. Included also are maps of the 48 states showing counties and muncipalities.

Shelter in Transit and Transition

A catalogue on the occasion of an exhibition by the Cincinnati Art Society. It takes the house in its movable forms and traces a development beginning with the Indian tepee and other early types of portable shelter to prefabricated and mass-produced homes. It includes related structural discoveries and several individual solutions for demountables, community patterns, and prefabricated interiors. Published as a guide, it still manages to have merit of its own.

Short Rations for Local Government

By Thomas H. Reed. Reprinted from the National Municipal Review, Vol. XXXI, No. 8, September, 1942. What the war is doing to upset the city tax balance and how this will reflect in necessary curtailment of city expenses. There are two possibilities—improvement of administrative machinery, and elimination of activities or services. Warning is given against unwise subjects for curtailment.

Then and Now

Fourth Annual Report of the Housing Authority of the City of New Haven, 1941-1942. Chapter two of the city publication reviews New Haven's beginnings in the field of low-rent housing, brings up to date the description of works accomplished, with all vital statistics. Projects include Elm Haven, Quinnipiac Terrace, Farnum Courts, and West Hills.

Planning Industrial Location in Britain and America

ARCHITECTS JOURNAL, January 28, 1943. This article in the English architect's magazine speaks of the need for controlled decentralization for security and wholesomeness. Dissimilarity exists in the British attitude toward the movement of industry to the country and the attitude of Americans. In America industry is welcomed; in England its movements toward the country are disliked. There is a

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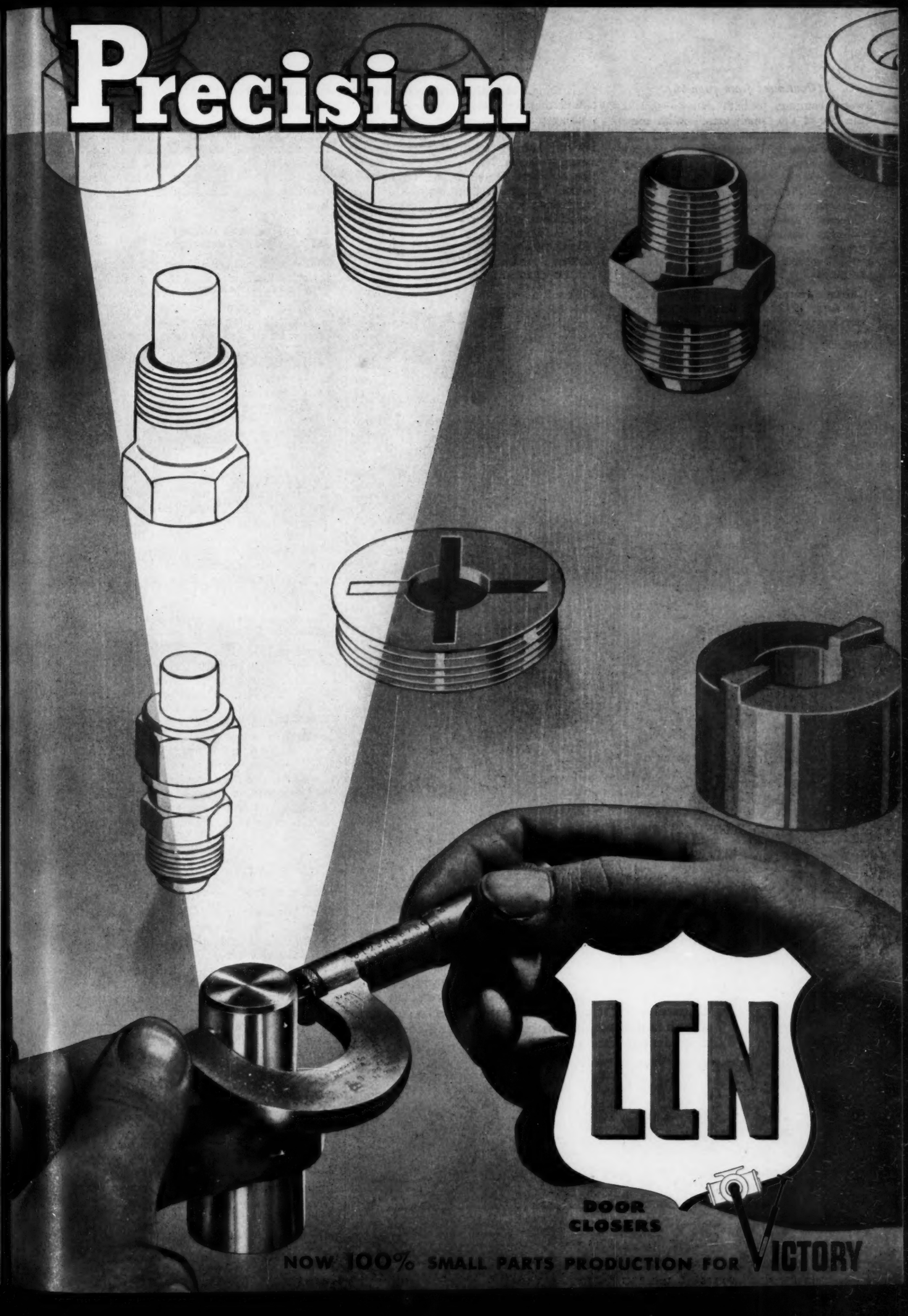
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(Continued from page 96)

worry common to both nations—that is the fate of the "small man." With complimentary comments on TVA and National Resources Planning Board, the article advises a strong central planning board.

Physical Planning. A short article in the same issue comments on jealousies and differences among a group of planners of different professions. Notes harmony in group as first step in good planning.

Legislative Information

Citizen's Housing Council of New York, February, 1943. A bulletin published biweekly covering all legislation pertaining to housing. This issue takes up a bill authorizing the creation of a state debt for housing purposes, a bill for appropriation of a million dollars for slum clearance and low-cost housing facilities in the second assembly district, New York. Another portion considers housing by insurance companies, rent control, multiple dwelling regulations, war emergency extensions of public housing law and multiple dwelling law, and demolition of vacant houses.

Urban Planning and Public Opinion

National Survey, research investigation. Melville C. Branch, Jr., September, 1942. Published by the Bureau of Urban Research, Princeton, N. J. The booklet is the result of a public opinion survey in urban planning. The bureau believes knowledge of the desires of the people for whom the planning is done is prerequisite to any consideration of the local problem. The technique of the survey is taken up at length and the answers tabulated.

Urban Problem Areas—An Appraisal Technique

To be used as a basis for the housing policy of local governments. Reprint No. 2359 from the Public Health Reports, 1942. From a program of basic principles of healthful housing are selected the appraisal items, and these are adjusted to survey technique. Test surveys having been made, the report continues on to discuss conservation versus construction, the enforcing of regulations, and rigidity of standards necessary.

Conference on Urban Redevelopment

Brief of Proceedings. Cranbrook Academy of Art. September 10-11, 1942. A discussion touching on all present and many future housing problems, control of land price, legislative organization, property ownership and control, need for powers of condemnation, undesirability of segregation of income groups in separate areas, and need for continuous planning organization.

Handbook on Urban Redevelopment for Cities in the U. S.

Issued in 1941, with much credit given to Frederick Bigger, FAIA; H. V. Hubbard, FASLA; James S. Taylor and Seward Mott, of FHA. This 104-page, paper-bound booklet is perhaps the most straightforward and coherent exposition of a method of attack on the practical problems of city planning and replanning. After a brief outline of premises, there is a comprehensive treatment of the preliminary steps, means of setting up planning organizations and obtaining data, and of defining, studying, and coping with the countless problems which arise. Available from the Superintendent of Documents, Washington, D. C., 15 cents.

After Defense—What?

Full employment, Security, Up-building America. National Resources Planning Board, Washington, D. C., August 1941. Believing that our greatest resource is full employment, this booklet, looking to 1944 as the end of the war, deals with the problem of putting to work immediately the twenty-three million men freed from war demands. Intended not as a blueprint but as a guide to intelligent thought and organization, it summarizes assets and shows possible losses under an inefficient system.

Better Cities

Building America. National Resources Planning Board, Washington, D. C., April 1942. Calling for an outline plan for postwar organization in which would be delineated the city's position in the state, the region, and the nation, the booklet strikes

(Continued on page 100)

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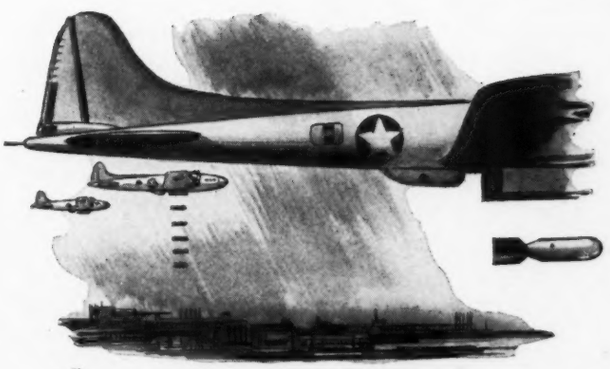

1 Current

Tar that once roofed American factories now "unroofs" German factories—Coal derivatives which used to go into coal tar roofing pitch are now one of the richest sources of war-vital materials for electrodes (used in electric furnaces to produce aluminum).

2 Contemplated

Wartime roofing proves anew that coal tar is best—In one war factory alone, more than 200 railroad carloads of Koppers roofing was used. On vast roofing projects like this, valuable lessons have been learned in roofing . . . and the best advice still is: "Stick to coal tar."

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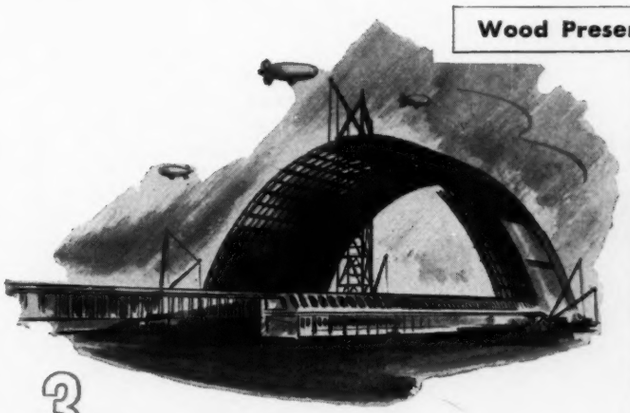

3 Current

Pressure-treated timber replaces critical metals to speed war production—The proven ability of pressure-treated timber to serve for years under extreme conditions of exposure provided a huge reservoir of construction materials for war industries and for essential civilian uses. Millions of board feet have been treated in Koppers pressure-treating plants to resist fire as well as decay and insects.

4 Contemplated

Air-conditioning brings need for pressure-treated timber—Air conditioning is often used to maintain a relatively high degree of humidity, which is conducive to decay. Factory owners have found Koppers pressure-treated timber immune to decay. Use pressure-treated timber in roof decks, trusses and other places exposed to moisture—Koppers Company, Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

(Continued from page 98)

at a fallacy already evident in the blueprinting for New York's postwar work. It warns that the "bad patterns of the past, physical or institutional" must not be repeated in the haste to build. Included in subjects discussed are, "Taxation as an Incentive to Building," "Comprehensive Local Planning," "The Training of City Builders," and "Unfreezing Urban Land."

Britain Rebuilt

Eric S. de Maré, London, August 1942. An exciting review of the background of the chaos which is modern architecture and planning in England, brought up to date by farseeing observations on new methods and materials, finally drafting a plan for *Britain Rebuilt* in terms of practical function of agencies.

The Problem of the Cities and Towns

Report of the Conference on Urbanism held at Harvard University, March 5-6, 1942. Edited by Guy Greer. A report on the conference divided into four sessions and four main topics: "Economic Determinants of Urban Development", "What Kind of Cities Do We Want?", "Administrative and Legal Problems", "The Role of Federal, State, and Local Governments". Supported by statistics, the views expressed here are those of a group of educators, planners, and city and state officials. An exchange of wishes for planning programs between theorists and administrators, this conference fills a need in planning. It is culminated by an article on the urban community of the future by Walter Gropius and Martin Wagner.

Education for the Air Age

N. L. Engelhardt, Jr., Board of Education, Newark, N. J. Macmillan Co., N. Y., 1942. A discussion of the need for social and economic planning. Published for teachers.

Future of Urban Real Estate

Report of speech by Guy Greer on the Greer-Hanson plan for land-use taxation.

The Story of Hill, New Hampshire

Don Stiles, Sugar Ball Press, Concord, N. H., 1942. A review of the moving and reestablishment of the town of Hill.

Outline for "Master" Community Survey

Construction and Civic Development Department, Chamber of Commerce of the United States, Washington, D. C. The outline points out the impatience of cities for quick results as the chief weakness of former surveys on community life, and suggests a plan for the development of a survey which, in final effect, is a master plan for the future of the city. That a plan must be a flexible, living thing is stressed, and a thorough typical survey is laid out as a guide.

"New" Deal for Redevelopment

Article in leaflet of Citizens' Housing Council of New York, March 1943. An article condemning a bill before the New York State Senate and Assembly providing tax exemption for redevelopment companies and the transference of property condemned for public use to private ownership. Blight is predicted as a result of this bill because it does not allow for changing conditions.

Pennsylvania Planning

Issued by Pennsylvania Department of Commerce, State Planning Board, Harrisburg, Pa., July 1942. Concerning Pennsylvania's own planning problem and discussing Philadelphia, Harrisburg, and Pittsburgh with emphasis on the importance of proper zoning.

Town Planning

A Penguin book by Thomas Sharp, England. First published in 1940. Looking toward the rush to build following the war, this small book advises a program for England's postwar work before it is too late to help. The town and country traditions of England and America are compared.

Traffic and Parking Study

A Plan for Improvement of Conditions in the Central Business Areas of New York City. Regional Plan Association, New York, 1943. By means of graphs and charts, an attempt is made to solve the problems of traffic and parking in the City of New York.

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